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1905

..THE.. CHICK BOOK

**FROM THE BREEDING PEN THROUGH THE SHELL TO
MATURITY**

***Contains the Experience of the World's Leading Poultrymen
and All the Latest and Most Trustworthy Information About
Hatching, Rearing, Fattening and Marketing Chickens.....***

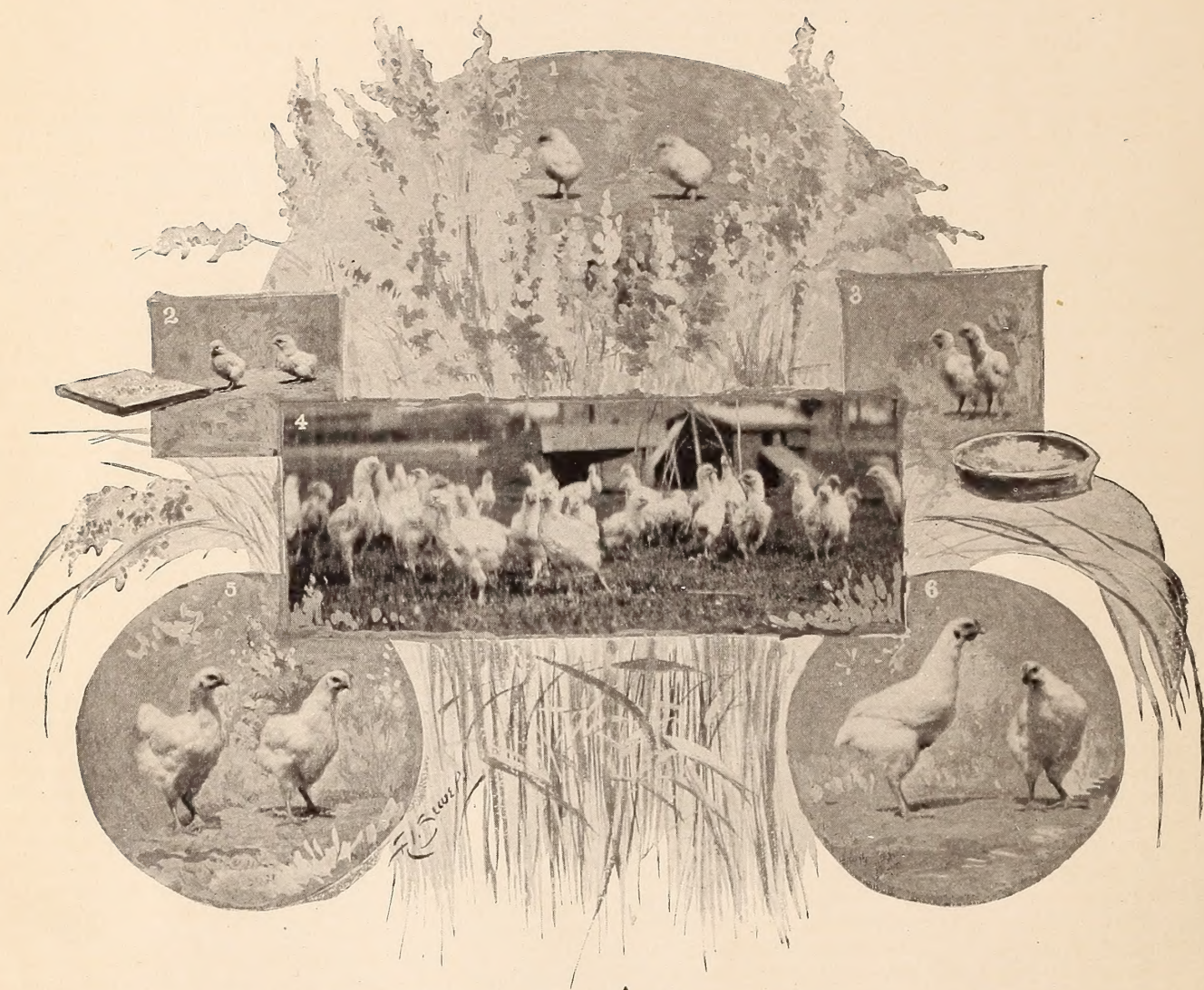
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A SUGGESTION OF PLEASURE AND PROFIT.

THE CHICK BOOK—INTRODUCTORY.

Success in Hatching and Rearing the Chicks is a Chief Essential to Profitable Poultry Keeping—How to Obtain the Knowledge Required for Success and How to Apply that Knowledge.

THE poultryman's profit depends in a great measure upon his success in rearing the chicks. Success is attained only by intelligent use of correct methods. If the incubation, growth and development of the chick are not attended by such conditions as produce and maintain the good health necessary for building a vigorous body and strong constitution, the grown bird does not have the power to produce, or earn, more than a nominal profit for its owner, however well it is housed and cared for. Nor does the negative effect stop at the profit of the first year; the progeny of such birds is not only weak and unremunerative, but if raised under like conditions will be less valuable than the parents and such rapid deterioration will render the flock absolutely unprofitable in two generations. On the other hand, chicks well hatched, from good eggs, if given intelligent care and surrounded with the essentials required for proper growth and robust development, will mature into fowls which are capable of returning to their owner the last cent in payment for the food and accommodations provided. Such methods increase the productive efficiency of succeeding generations and the road to a competence is auspiciously opened.

If the chicks in hand are to be marketed as squab broilers, broilers or roasters, the problem of improving them for stock purposes is eliminated; but the necessity for painstaking effort is not lessened, if indeed it is not increased.

The chick destined for the market must make a very rapid growth; not so much of bone and muscle, as of flesh and fat, and to do this in the least time assures the greatest profit. Conditions, too, at the time when such chicks must be grown to command the top price must be largely artificial. Natural conditions must be approximated as closely as may be, or the young birds cannot stand the heavy feeding necessary to produce the results that count. To one whose heart is in the work, it is as interesting as it is important and offers opportunity for the full exercise of both his mental and physical faculties.

That a large per cent of all strong chicks hatched can be raised to the age for marketing, or to maturity, is not disputed. The present-day appliances greatly facilitate the work, and prepared foods, selling at reasonable prices, simplify the problems of feeding. Establishments properly equipped and handled are raising chicks in numbers that were scarcely dreamed of two decades ago, and by placing them on the market in good condition at a time when the majority of producers have nothing to offer, they obtain extreme prices. Later in the season when the market is filled with chickens from farmers and less energetic and less up-to-date poultrymen, the large raisers, with their better equipment and thorough knowledge of the business, are able to place their goods on sale in more attractive condition and at a lower cost of production than their competitors, securing a better price and larger profit.

This is not intended to indicate that large plants are the only ones that can and do accomplish satisfactory re-

sults. Small plants are doing good and remunerative work on a smaller scale; some are growing chicks for market, and others for stock purchases; some are doing the work by artificial methods, while not a few hold to the motherly hen of thirteen eggs capacity.

After giving due credit to the appliances and improved foods, for the part they play in producing good chickens, the major share is left to be distributed between hard, conscientious work and well grounded knowledge of the business. Of all these factors knowledge is the greatest and the one most difficult to secure. When it is found it commands its own price.

How Knowledge Is Obtained.

There are two ways of acquiring this knowledge: by years of costly experience and by careful study of the best poultry literature, supplemented and verified by practical experience. The former, although good, and enduring as the hills, places a man too near the far end of life's journey when it graduates him and burns up money which ought to be saved and invested in the business. The latter is the shorter road and enables one, by taking advantage of the experience of others and avoiding their mistakes, to cut cross lots to success with money in his pocket.

The printed wisdom of poultry culture is as far ahead of that of ten years ago as can be imagined. In gathering the material for this book the same sources of information have been drawn upon that furnished the matter for the other popular books published by this company; that is, the poultrymen and women who have made a substantial success in the business and who are specially fitted to write upon the subjects assigned them.

Such information, though difficult and expensive to obtain, is valuable almost beyond estimating. It consists not in dry rules and dogmatically expressed theories, but in the live experience of men in the field, with the whys and wherefores for every step and dependable guidance at every turn. It is information that can be trusted to the letter. By following it the mistakes of the novice can be avoided and the methods of the more experienced may be improved.

This is not a one-man book, but a broad-gauge one, holding out to the reader several courses which have proved successful so that he may choose from them whatever seems best adapted to his requirements.

Condition of the Breeding Stock.

Securing good condition in breeding birds is not difficult. Any poultryman worthy the name selects each season birds having the development and style that denote vigor and constitution while selecting the shape required for the variety at hand. It is a fact that birds of standard size and shape are not produced year after year by any but healthy, vigorous stock. Constitutional vigor is the source of strong procreative power and is built up only by careful breeding for a term of years.

With this characteristic well established, it remains only to maintain good health and normal condition of flesh

to produce eggs that will bring forth chicks that live, thrive and make a profit. In this connection it is safe to remember that appearance, although a good indicator of health, is not infallible, for a bird may seem to be in the best of condition, when it is unable to produce a fertile egg. Supply the food and conditions required and trust to nothing less, whatever the appearances, to bring about the desired results.

Every effort should be made to conserve the energy and maintain the strength during the winter, when conditions are largely artificial. This does not mean that all profit from the birds in a practical way must be lost or that hens may not lay well during the winter and produce fertile eggs in the spring. The best rule to follow is this: provide as well as possible the exercise, fresh air and foods that the hen would get if allowed her freedom on a grass range in summer.

We cannot lay down a rule for feeding. What will produce good results in one yard will not always do so in another, because of different conditions. Sufficient information upon the feeding values of all commercial foods and their effects upon birds under various conditions is available, so that a little experience and intelligent observation will enable any one to compound the ration best adapted to the needs of his flock.

Incubating the Eggs.

That the up-to-date hatchers can be depended upon to do their full share toward making the poultryman independent requires no argument. Good eggs and proper handling by the operator will assure good hatches of vigorous chicks. An understanding of the machine and how to control it, with some knowledge of how to treat eggs during the period of incubation and of the essentials of correct environments, constitutes the wisdom required for successful hatching.

We find incubators operating in dark cellars, where there is no light except that of burning kerosene; where good air enters by chance and not from intention, and the atmosphere is damp and laden with germs of decay and disease. Again we find them located in rooms above ground, in houses built for the purpose, in dwellings and in rooms partitioned off in the barn, poultry house and shed where the air, though dry, is seldom renewed and light from the sun is rigidly excluded that a more even temperature may be maintained.

A strong man could not stay in one of these places an hour and the flame that heats the incubator frequently has difficulty in collecting enough oxygen for perfect combustion. To expect to develop so delicate an organism as an embryo chick under such conditions, is nothing less than folly; yet some people attempt it and, failing, denounce the machine and artificial incubation. How to provide the proper environment and successfully operate the machines is plainly told in succeeding pages.

Brooding the Chicks.

There are good brooders and brooding systems, and good foods ready to feed. These ready made factors in success are easily obtained, but for their efficiency they depend upon the discriminating mind of one skilled in the work. In no other branch of the business is the effect of level thinking and well directed effort more noticeable. Five minutes in a brooding house will frequently enable the intelligent observer to estimate correctly the ability of the man in charge; for the appearance of the chicks is the best possible evidence and no flock of chicks is healthy and vigorous that does not look so.

It is of primary importance that every aid to good health is supplied, for enfeebled constitutions are as frequently caused by bad housing, brooding and care as by improper feeding.

Cleanliness, good ventilation and exercise exert more influence than the novice is prone to believe. As the blacksmith's arm grows strong by constant use, the physical structure of the chicks grows strong and is kept in trim by running about and scratching in clean quarters, where fresh air supplies the material for myriads of life-giving blood corpuscles and the digestive organs are made capable of converting to the body's use all the nutriment the food contains.

Hatching and Raising With Hens.

There are more than a few who, though they admit the practical worth of artificial methods, still cleave to the ways of their grandparents and find satisfaction and profit in so doing. The usefulness of the broody hen is by no means a thing of the past. The breeder with a sitting of eggs from a favorite hen to be hatched and the chicks reared by themselves, the owner of the farm yard flock and the village poultryman with a dozen hens find biddy up-to-date and sufficient for their needs.

So much latter-day intelligence has been applied to chicken culture that sometimes it becomes too great a burden and the hen is divested alike of her natural responsibilities and of her opportunities. Our forefathers allowed the old hen to have pretty much her own way and she, taking advantage of the good things that nature provides, not alone hatched and raised the chicks at less cost, but presented better chicks. Nature's ways are more resultful than the made-to-order methods sometimes recommended. The hen that is allowed to run with her chicks in the daytime, searching for the nutritious worm and balancing the supplied ration by the food selected from field and swamp, will raise a brood that is a credit to the breeder and that will stand him in good stead the following winter. The successful raisers approximate these conditions as closely as the circumstances permit.

Maturing the Flock.

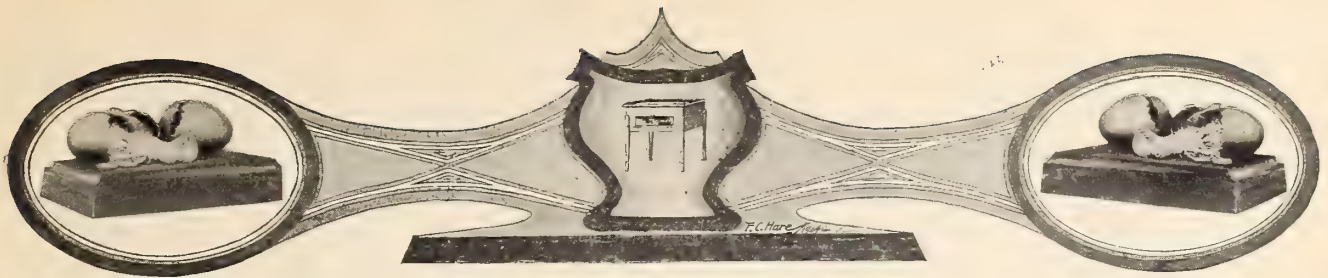
A chick well started is half raised; but it must be well cared for, or it will not win in the show room, or command a premium in the market. Good care does not mean that manner of feeding and housing which pampers the birds, but the care that supplies them with plenty of good food and an environment conducive to their physical welfare. The plan of colonizing the youngsters in roomy, open front roosting coops, works wonders toward the production of sturdy stock and hopper feeding not alone reduces the labor involved, but in many cases seems to hasten growth faster than the time honored system of three meals a day.

The Value of Common Sense.

This is an age of practical things in poultry culture and the application of common sense to all its problems is fast clearing it of much of the theory which has been "thrust upon" it. It is the person who goes at the work with sleeves rolled up whose success can be counted in big round dollars and whose advice is worth all it costs to every earnest worker.

The experience of such men, and women, too, is given in detail in this book and we recommend their articles to the reader with full assurance that their advice may be taken for its face value.

H. A. NOURSE.



OPERATING AN INCUBATOR.

Hints on Buying the Incubator and Becoming Acquainted with Its Use—The Advantages of Testing the Eggs—Why Pure Air Is Necessary—The Difficulties of Late Hatching—The Importance of Good, Hatchable Eggs.

By A. F. Hunter.

MANY people are intending to buy an incubator and brooder, and some suggestions to that end will be timely. Do not put off buying too long. Do not wait until you need to begin hatching. There are very manifest advantages in getting the incubator into your possession, and becoming to a certain extent familiar with it. We know a man who intended to buy an incubator, but put it off, for one reason or another, until it was time to begin hatching, and, indeed, he had actually begun saving eggs for hatching. He then sent the money for the incubator and asked the manufacturers to "please hurry it along." They shipped it at once, but he, after waiting some ten days, wrote to know why his incubator had not arrived. As it was on the way, all the manufacturers could do was to start a "tracer" after it, and the incubator and tracer reached the man's railway station practically together,—the incubator having been thirteen days on the road.

While such a delay may be unusual, still, there are possible delays, owing to the transfer of the machine from one railway to another at a junction, and that means unloading it onto one platform, trundling it to another platform and loading on another car, etc., etc., etc.; any one who is acquainted with freight shipments knows the vexatious delays that are possible. Therefore, we say buy your machine in good time so as to avoid the possible misfortune of delay in transportation. Another point is that you get an opportunity to get the machine set up at a time when you have plenty of leisure to do it right and get the conditions right; you can also take time to get acquainted with the machine so as to run it to the best advantage and greatest convenience to yourself. That point of getting acquainted with the machine is a most important one.

We have a letter from a lady in Montana who says that she bought an incubator last spring, got it home to her house about noon, went to work uncrating it and setting it up as soon as she had eaten her dinner, and at 5 o'clock in the afternoon put the eggs into it. A little consideration of the risks those eggs were subjected to will illustrate the point. She had never seen an incubator before and had no idea of running one excepting what she got in the directions sent with the incubator. As fortune favored her, she got a good hatch, but the chances were certainly very much against it; and it is very foolish to take chances when we can avoid them by taking time by the forelock. It is good, sound advice to take three or four days in which to gradually warm up the machine to the desired temperature, see

that the regulation is properly adjusted to the desired point, become familiar with the individuality of the lamp so that the flame can be set at pretty nearly the same point after each filling and trimming,—in fact, become "familiar" with the methods of operating the incubator. This is purely elementary advice, but the great bulk of incubator buyers are amateurs, and very many of them have never operated incubators before, hence these same "A, B, C" points have to be gone over every season in order to best help those who are just starting with incubators.

Test the Eggs.

A not uncommon fault of inexperienced incubator operators is to neglect testing the eggs. This is a mistake for several reasons. First, there is always a proportion of eggs that are absolutely clear, running usually from 10 to 25 or 30 per cent, and those clear eggs are perfectly good for cooking. They are not quite fresh, of course, since the six or seven days that they have been in the machine have "staled" them to a certain extent, but no more than if they had lain on the counter of a country store for a few weeks—as is very frequently the case. Large operators usually sell those infertile eggs to bakers and confectioners, and they are used up in making cakes, pies, custards, etc.

A decided advantage in removing from the trays those clear eggs is that there is more room for the fertile eggs in the trays, and they can be turned and handled more easily; even if no second test is made, a first test, to take out the clear eggs, certainly should be made.

A second test about the fourteenth or fifteenth day, to remove germs that have died since the first test, is a help to a good hatch. Those dead eggs usually throw off slight odors or deleterious matter, hence a good hatch is promoted by getting them out of the machine. Another argument for testing eggs is that it increases one's knowledge of embryonic life and development, and enhances the interest of artificial incubation. A good tester is sent out with every incubator sold and we strongly urge the buyer to start right,—and learning to test his eggs is an important part of that start.

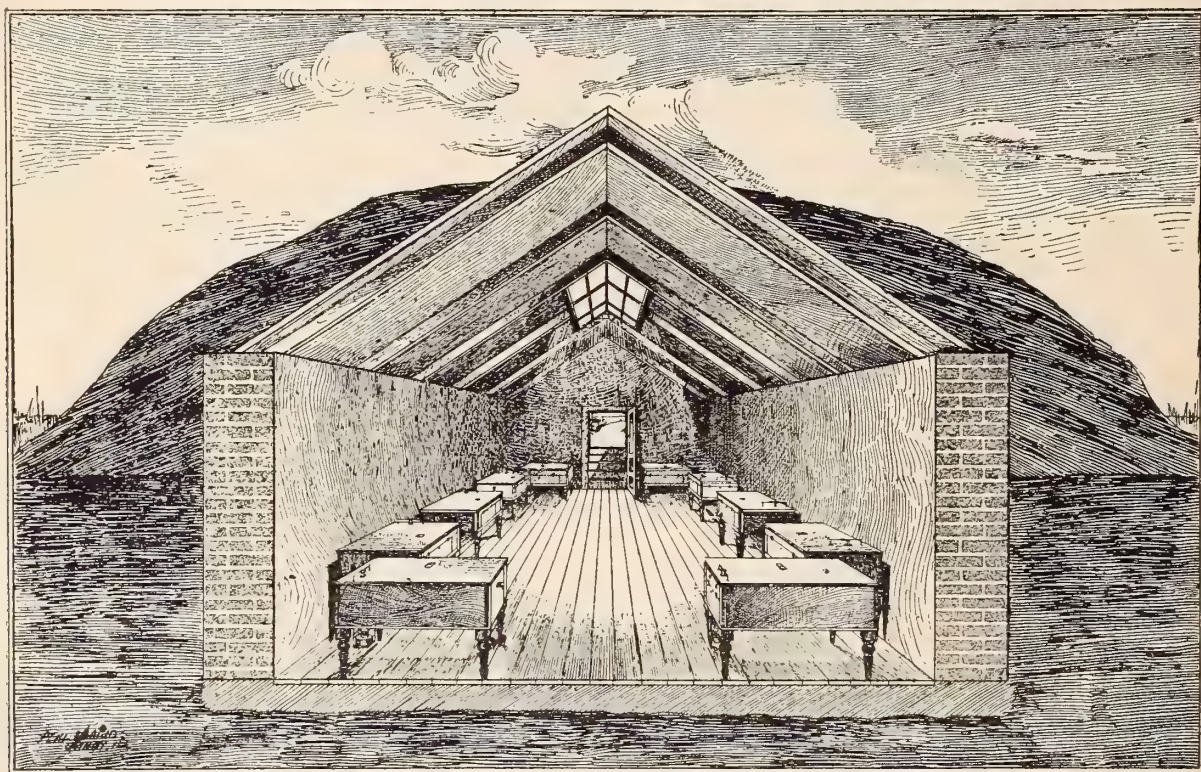
Dark shelled and thick shelled eggs are more difficult for an amateur to test than are the more common white-shelled eggs, for the reason that the light does not shine through them so well, and even an experienced tester may mistake a clear egg for a probable germ; that is, the yolk may throw a shadow that will have the appearance of a good, strong germ.

It is well in learning to test to break a few eggs that one is doubtful of and learn the appearance of clear eggs, dead germs, strong-living germs, etc. Do not be afraid to sacrifice a dozen or two of eggs in the interest of gaining knowledge—it is a good investment in the long run.

Supply Fresh Air.

Be certain that there is an abundant supply of fresh air in the incubator room at all times. A serious mistake of beginners is being afraid that a little fresh air will jeopardize the hatch. It is important to remember that if you have 150 living germs in an incubator all of those 150 living organisms are consuming oxygen every day and every minute of the day, hence it is important that they be abundantly supplied with that life-giving element. If the incubator is in a moderately warm place, say about 60 degrees, more air

or soft-roasters early in the spring. Having the incubator and brooder equipment and the winter season being a time when the farm work does not crowd so hard, it is natural to think of having some chickens to bring forward to market; the cash received from selling them is always welcome. A most important point in starting the incubators is that they be carefully and thoroughly cleaned up, especially on the inside where the actual work of incubating is done. It is not so well known as it should be that disease germs lurk in uncleaned incubators and brooders and that not a small proportion of the mortality of baby chicks is due to the unsanitary condition of incubators and brooders. A few years ago the Rhode Island Experiment Station was much troubled with this mortality of baby chicks, and some hundreds of cases were carefully examined for the purpose of



An Incubator House Banked with Earth to Protect It Against Changes of Temperature.

can be admitted to the machine and the eggs can be cooled and aired a longer time than if the machine is in a considerably colder place. This means that cooling and airing the eggs should be much less in cold weather than in mild, spring weather; then, too, you can do decidedly more cooling and airing the last third of the hatch than earlier, and the living embryos will be the better for it. The practice of operators varies considerably, some cooling and airing the eggs a great deal after the first week, and there are some who cool and air from the very start almost. Generally speaking, however, if the incubator is in a cool place it will be found that the eggs get sufficiently cooled and aired at the daily turning the first week, then a few minutes a day the second week, and the last week (up to the time of pipping) five to ten minutes a day is none too much. Indeed, if the animal heat in the eggs is strong and the temperature of the incubator room is 60 degrees or above, quite a long airing daily will be beneficial.

Some of the Difficulties of Late Hatching.

Some poultry raisers start hatching in the fall, with the purpose to have broiler chickens to sell in the winter

locating the cause, and one of the causes given in the report is: "Imperfect sanitation; lack of ventilation, sunlight, etc., e. g., tuberculosis flourishes in dark, poorly ventilated brooders; 15.1 per cent of the post-mortems showed more or less evidence of tuberculosis." A similar case was reported as afflicting several practical poultry farms last winter and so serious did the trouble become that an expert on poultry diseases was called in to carefully examine a lot of the dead chicks to see if he could locate the cause. He hadn't proceeded far when he located tuberculosis as being the principal cause; a thorough cleaning up and disinfecting of incubators and brooders was prescribed and within a week the deaths practically ceased.

"Prevention" is so very much better, simpler and easier than cure! How much of both pecuniary loss and trouble those poultrymen would have saved if they had simply cleaned up and disinfected the incubators and brooders before commencing operations in the fall. Improper feeding and overcrowding are also prominent causes of the loss of baby chicks, but those are easily preventable causes; any one losing chicks from those causes has only himself to

blame for it! And the disease germs also are easily preventable; cleanliness and disinfecting will down them and keep them down; hence any one who allows them to breed in his incubators and brooders and pounce upon his baby chicks has only himself to blame for it.

Getting Good, Hatchable Eggs.

Another difficulty to overcome in hatching fall and winter chickens is getting good, hatchable eggs, but practical market poultry raisers overcome this difficulty, as is proved by the fact that they hatch and raise fall and winter chickens. Eggs of all kinds are very scarce in the fall and early winter, and to get good, full-bodied eggs, eggs that will produce a fair proportion of strong, healthy chicks, is the problem. If pullets have now begun to lay, their eggs are rather small in size, and, as a rule, if they are used for hatching the chicks one gets are likely to be small and weak. Eggs from mature hens are the best, but they are mostly just recovering from the molt and lay few, if any, eggs. Hens can be induced to molt in summer and be wholly recovered from it and in full lay again by October if handled for that object, and if one has eggs from such hens of his own, or can get a supply from farmer neighbors, he is fortunate and can hatch winter chicks.

There is great difference in eggs, and marketmen speak of the best as being "full-bodied and strong;" others are classed as "weak and watery." It is only the best "full-

bodied and strong" eggs that will hatch strong, vigorous chicks; it is well known that eggs which are weak and watery cannot produce strong chicks. The food and bodily condition of the fowls control the quality of the eggs, hence the hatchability of the eggs is largely in the control of the manager of the fowls. The West Virginia Experiment Station has recently reported some tests of "mash feeding compared with whole grain, and heavy feeding compared with light feeding as affecting the number of eggs laid and their hatchability;" also, "beef scraps, ground fresh meat and bone, and milk albumen as affecting the hatchability of eggs." The conclusion of the first series of experiments says: "It is seen that the eggs from the fowls fed liberally hatched better than those from the fowls fed scantily;" also, "The results from these two tests should be construed as indicating that when the conditions are favorable for normal egg production, then the eggs will hatch better than when the conditions are unfavorable." It is quite possible that the above tells us nothing new, but it is a restatement of an important truth which we need to have frequently put up to us. The liberal feeding is important, but the good care, right sanitary conditions, fresh air and sufficient exercise for good health are equally important factors for the production of good, hatchable eggs, of eggs that are "full, strong bodied," well shelled, and all right in every way.

A. F. HUNTER.

THE ENVIRONMENT FOR INCUBATORS.

Fresh Air and Sunlight are as Essential for the Processes of Incubation as the Correct Degree of Heat.

By H. A. Nourse.

THERE is no question but we have good incubators—machines that will do their part if the operator will provide proper environments, give them necessary care and furnish good eggs. The fact that any hatch at all is secured where the operators are careless of everything but the machine itself, is a telling recommendation of the present day hatchers.

Aside from the proper control of heat in the machine, nothing is of greater importance than a favorable condition of the surrounding air. Oxygen is a necessary factor in success and must be provided. To shut an incubator in a small, dark room where to confine the heat every door and window is shut tightly, or to place it in a dark, musty cellar, where but little fresh air enters from autumn to spring, is to deprive yourself of its benefits.

Sunlight is one of the best air purifiers and germ destroyers, but should not be allowed to shine through the glass doors of the machine. For this reason few cellars are fit for incubator rooms; yet, when one has ventilation sufficient to keep the air pure at all times and windows above ground through which the sunlight may shine, it is the very best location for a machine, because the temperature will be less variable than in a room or building that is wholly above ground. In the absence of these conditions an ordinary room in a dwelling, without heat, will be found best adapted to the requirements of those who do not need or cannot afford a building especially for this purpose.

Ventilation may be secured and controlled by dropping the windows at the top and raising them at the bottom, pre-

venting a draught in severe or rough weather by inserting cloth-covered frames in the open spaces. By having these frames in two or three sizes and one or more windows the situation may be thoroughly mastered.

It is a fact that small buildings designed for the purpose do not, as a rule, provide the favorable conditions described, therefore are not very satisfactory. Of those above ground few are well enough built to protect the machines in severe weather without closing every source of fresh air, in which case that confined in the building, usually of small contents, is soon impoverished by the lamps, which abstract the oxygen, leaving unhealthy gases in its place. Houses partly or wholly below ground to the eaves almost invariably lack sufficient ventilation, because it is more difficult to introduce fresh air. The best room of this kind is one having a building above to temper the heat in summer and the cold in winter; walls extending five feet below the ground, and two feet above; one-fifth of this exposed area of walls being of glass. Good ventilation necessitates a constant changing of the air by bringing in fresh air from without the building and removing the air which has become laden with impurities. To accomplish this, fresh air must be introduced near the ceiling of the room, preferably through a cloth diaphragm, and the foul air drawn out from near the floor by means of tubes extending from within one foot thereof, up through the highest point in the roof of the building. In this manner the room may be freed from all gases without the aid of direct draughts and the chicks will be strong and healthy, if other conditions are favorable.

H. A. NOURSE.

VENTILATION AND MOISTURE IN INCUBATORS.

The Greatest Problem in Successful Artificial Incubation Is in Ventilation and Moisture—The Egg Contains a Proper Proportion of Elements to Build Up the Embryonic Structure—Death of the Embryo Follows Abuse of Nature's Laws.

By H. E. Moss

ONE of the anomalies in the incubator business of to-day is the diversity of treatment to which eggs are required to be subjected under the instructions of the makers of the various machines now on the market and their ability to furnish pages of testimonials in support of their claims of the merits of their particular machine. There can be but one correct process or method of incubation, and that is nature's method. If we would duplicate nature we must conform to her method. I have before me thirty catalogues from as many different incubator manufacturers. I have been examining these books and comparing the claims and theories of the different makers



Two Incubator Houses in Use on an English Poultry Farm.

so far as they pertain to the essential requirements of a successful hatcher. There is but one point upon which they all agree, and that is the proper incubating temperature. The ease with which this fact can be determined accounts for this, but there are other conditions besides temperature upon which successful hatching depends, and in these they not only advance contrary theories, but in some instances proclaim them as self-evident truths. Turning and cooling the eggs are provided for in various ways, some even going so far as to furnish a cooling schedule for each day of the hatch, each one differing from the other. It is not with this question, however, that I propose to deal at this time, but the one embraced in ventilation and moisture.

We are told very emphatically by some that at the end of a certain day the egg must show an air space to correspond with a given diagram, and at the end of certain other days it must show certain other fixed lines of air space, and that if the eggs are placed in warm water on a certain day and they float with an exposed surface equal to a silver quarter in size, the evaporation is right. Now this may all

be approximately correct and agree with normal conditions, but they go further and say that if they are found deficient the ventilation must be increased and if excessive it must be diminished and moisture introduced.

This sounds very plausible to the unthinking or those who jump at conclusions. That all eggs lose a certain amount of moisture during incubation is very apparent, but the question is how do they lose it? From the rules they lay down for the purpose of increasing or diminishing the air space, we must assume their hypothesis to be that there is a certain amount of water created in the egg that does not belong there and that the Creator made the incubating body a party to the reproductive process, and did not create a perfect egg in a perfect condition to reproduce the species without the intervention of this outside agency to rearrange, as it were, its contents.

The absurdity of such an hypothesis is apparent.

Can we imagine for one moment that in His infinite wisdom He would establish any incomplete or imperfect thing, or law, as must be inferred in this case, whereby some species are taught to deposit their eggs in suitable locations and never see them afterward, and that such eggs should not contain the proper proportions of all the elements necessary to build up the embryonic structure? No, we cannot conceive of any such condition. We must assume that whatever is placed within the egg is necessary to the perfect development of its germ, and that if we wish to incubate it successfully we must not rob it of any one element or any part of one, and that if we do it suffers in consequence and in proportion to the degree of abuse to which we subject it.

It has taken a number of years for incubator makers and operators to correct their ventilation. Carbon dioxide has been a bugbear. They find they need no longer fear this. They now unintentionally cease robbing the egg of its moisture and realize the fact that under the new conditions the hatches approximate natural methods. The moisture pan is now a back number. The only benefit it ever worked was to partially equalize the aqueous tension between the inner and outer air, a condition which need not exist in a modern incubator. A current of cold air drawn in through the ventilating flues increases its capacity for moisture in proportion to the increase in its temperature. Its relative humidity being lower than the outer air, it gathers moisture from the eggs in sufficient quantity to restore the equilibrium. The allantois is robbed of its fluid and the membrane becomes dry, destroying its function as a respiratory organ, and death of the embryo follows. The greatest mortality from this cause occurs during the third week.

The ventilating flues and forced drafts with which many machines of to-day are equipped are wrong in principle, although it is possible to operate fairly well with them, provided the apertures are reduced to the minimum and employed solely for the purpose of maintaining the air pure in

the egg chamber. Natural variations in the atmospheric humidity exert no influence, provided the aqueous tension is held the same within the egg chamber as without, and this is attainable in very few machines.

From the hour the egg reaches the incubating temperature there is a condition present within it which I have never seen noticed or described by any investigator. It is what might be termed a partial vacuum, a tension, or a tendency to shrinkage or contraction, which would naturally cause the absorption of oxygen to be more rapid than if it were compelled to depend upon diffusion only. This tension is more apparent on about the fourteenth day than at any other period. It seems to be rhythmic or intermittent and is suggestive of the process of breathing as we perform it, except that its operation is so slight as to be imperceptible except under certain conditions.

Every atom of water contained in the egg is intended to pass through the circulation of the embryo in combination with the other elements, and is absolutely essential to the perfecting of the structure, and after having been so utilized it is, as with any other elements that have been chemically transformed and served their purpose, thrown off as waste matter in the form of gases or urates. A weak germ, and by that I mean one that has not had a strong vitality, or life principle or impulse, implanted in it by the parent, or that has been reduced to this state by abuse, is retarded in its development. The impulse has either been checked or was weak to begin with. The normal diminution of the contents is checked or ceases entirely. The operator is told that he is using too much moisture and not ventilating enough, so out come the water pans and open go the slides, and at the same time an examination of all the eggs would perhaps show many at the normal stage. A strong current of air is now driven through the machine under the delusion that all that is necessary to make these weak germs hatch is by some means to extract the surplus mois-

ture they seem to contain and increase the air space, and I have no doubt but some would be tempted to draw it out with a hypodermic syringe if it were contained in a pocket in the egg and they were not convinced by actual experience that a rupture of the membranes would be fatal.

I would suggest to any who have doubts on this question to select a tray or a machine full of eggs showing small air spaces, say about the tenth to the fourteenth day, place them in a machine by themselves, take out all the water pans, open wide all ventilators, force all the air you can through the machine, and if you wish drive a warm blast through it by a fan motor, and see how many of them will come to exclusion. You can evaporate them fast enough and the faster, the quicker and surer the death.

There are some things about incubation we can never know. The life principle or impulse is beyond the grasp of finite minds. Starting with germs that in every living thing are identical in structure and appearance, and developing them from one plane to another until they reach the limit to which their impulse carries them, they become men, birds or fish, and thus perpetuate their species, the fittest always surviving. We mortals may speculate and theorize upon it, but we cannot fathom it.

Our hypothesis is that the Creator placed in the normal egg just what is needed there—no more, no less—and that if we can duplicate natural conditions we can successfully incubate them artificially, presuming that the parent bird in the incubating process contributes nothing but heat. If we can do this, and at the same time furnish oxygen sufficient to sustain the process we will succeed, but it must be just enough—no more, no less. The right amount to gauge the machines for, varies with the outer temperature, the stage of hatch and the machine used, as all vary in their power to induce currents—some are forced, others are natural. All these points must be taken into consideration.

H. E. MOSS.



A Substantial, Practical Brooding House in Use at White Leghorn Poultry Yards.

CARE OF BROODER CHICKS.

The Brooder Chick from Egg to Maturity—Ventilation, Moisture, Temperature and Floor Space Discussed by Breeders Who Know the Requirements of Brooder Chicks—Brooding Houses and Coops—Foods and Feeding—General Advice on Management.

[This symposium is devoted to brooder chicks exclusively. To hatch chicks in an incubator is comparatively easy, and may be done by a novice, but to raise the chicks after they are removed to the brooder requires a knowledge which does not stop at a thorough understanding of brooder operation. The movements and appearance of the chicks inform an experienced observer what is necessary for their well-being. To obtain the greatest growth in the shortest time, chicks must be healthy, comfortable and always on the jump for food. Improper conditions result in death. It is from men who are competent to raise brooder chicks with the lowest possible mortality that we have obtained the following useful information for our readers.—Editor.]

ADVANTAGES OF BROODER RAISED CHICKS— RATIONS AND CARE.

ONE of the most necessary appliances connected with the poultry industry is an A No. 1 brooder, even though a hatcher is not in use. It is an easy matter to find a number of sitting hens, and by placing in the brooder the chicks hatched by them, you avoid feeding the chick's food to the hens, and they will soon begin laying. The chicks can be cared for and reared safely, no matter what weather prevails outside the brooder. They are free from vermin and if the brooder is kept clean they will not be troubled with lice. There is no need of losing a chick if properly cared for. They will be much more tame and more easily handled than those reared by hens.

For from fifty to seventy-five chicks a run of twenty feet is sufficient for one to two weeks, after which the chicks should be placed in a larger inclosure or allowed to run at large. I believe in plenty of range, as chicks confined to small inclosures very seldom develop well, but often do develop off colored feathers in plumage, which nature provides against if they have large range. The run may be made of boards twelve inches high, a portion of which may be covered with cheese-cloth. This will afford protection from winds and storms, also from sun.

Chicks when first out of the shell can have no better food than bread for two or three days, then a mixture of cornmeal and bran (half and half in bulk), to which add a small quantity of bone meal, about one part to eight of the mixture of meal and bran. Wet this with water and it makes an excellent food for morning and noon. At night good, clean wheat and cracked corn, with oat flakes or hulled

oats is unsurpassed. Milk is very beneficial if placed where fowls or chicks can drink it, but should not be mixed with the food.

A good brooder, an abundance of the right kind of food, coupled with a fair amount of common sense, will bring good results.

W. F. BRACE.

LESSONS FROM NATURE—INTERESTING EXPERIENCES—LIMIT THE FOOD SUPPLY.

While we have most of our chicks raised with hens on farms we still raise some in brooders. We allow the chicks to remain in the incubator from ten to twelve hours after they are all hatched; then we put them into a warmed brooder with the floor covered two inches thick with wheat bran. After they have been in the brooder two days we scatter a little millet seed in the bran, but not much for a week. This season we have used a prepared chick food alternately with millet and have had success. When a few weeks old we feed cracked corn and whole wheat, in fact anything the chicks will eat, as great a variety as possible, and not too much at a time, keeping them in good appetite all the time, so they will take plenty of exercise. It is well to have plenty of chaff or cut straw, hayseed or anything of that kind to scatter their grain food in to make them work, not forgetting grit and green food.

Use only a brooder so constructed that the chicks can get any degree of heat they want, and one that allows the chicks to get away as far from the heat as they want to, and they will take care of themselves.

One thing in raising brooder chicks seems to us to be of more importance than anything else, and that is the feeding of the chick the first week of its existence. When a chick is hatched nature has supplied it with enough food so it can easily do without eating or drinking for a week or over. We will give one instance that will prove this without a doubt.

A few years ago we had a hen that would fly through a ventilator and get above a board ceiling in one of our chicken houses; there she laid a lot of eggs and hatched a dozen chicks. Judging from the looks of the chicks when we first found them they were about ten days old, and during that time they had neither food nor water. A stronger lot of chicks I never saw and they were as wild as deer.

In 1890 we took two hens with fifteen chicks each and put them into a cornfield a quarter of a mile from our buildings and left them to hunt their living as best they could. The chicks had no water or food, except what the hen found for them. After they were ten days old we went to see them and note results. We found the hens had not been ten yards from the place we put them, and such a sleek, healthy and



A Group of Fast Growing Chicks.

vigorous lot of chicks we never saw. Being satisfied with results so far, we left them another week, but when we went to see them we only found a few feathers from the hens, as a pack of dogs had put a stop to our experiments, but we learned this one fact, that very little, if any food should be given to newly hatched chicks for the first three or four days at least, and we believe there are more chicks killed by overfeeding in the first ten days of their lives than at any other time. This hardly ever affects the chicks until about the seventh day, when they get diarrhoea and stand around with full crops and soon die from indigestion, caused by strong food and feeding. We all know what a hen that steals her nest does after her chicks are hatched. She does nothing the first few days but brood her chicks, then after they are three or four days old she will commence to scratch for them, but very little do they get for the first ten days. They secure a few small seeds at a time, and as they grow, and their digestive organs get strength they find more food, and most of the chicks live and grow to maturity; they develop very fast, too. Let us watch the old hen and learn lessons that will help us much in raising chicks with brooders.

We think exercise is of great importance, and if one is so situated as to allow the chicks a good run it will be found very beneficial. If the room is limited use plenty of litter with dry food scattered through it. Avoid sloppy food. Remember dry food is nature's food and always remember, too, that little food is far better than too much.

AUG. D. ARNOLD.

ON BROODERS AND BREEDING.

Four years of experience with artificial incubating and brooding has settled definitely in my mind the fact that with it we can raise "better poultry and more of it." I mean by this, that we cannot only raise a larger quantity, but a better quality. This is from the standpoint of a fancier as well as a marketman.

In my hands brooder raised chicks are superior in growth and development, shape and plumage to those raised by hens. There are many reasons why this should be so, and these will be apparent to the unprejudiced poultrymen. My exhibition specimens have invariably been brooder raised.

If I could have but one I would prefer a brooder to an incubator. I do not think an incubator superior to a hen for hatching, but I do think a brooder superior to her for raising chicks. To be successful the floor of the brooder should be built as near the ground as possible, should be capable of generating sufficient heat, and should have a regulator that will maintain the correct temperature. I believe a regulator on a brooder in which you expect to place newly hatched chicks is as important as that on an incubator. The heat should come from above, with just sufficient bottom heat to keep the floor dry. The temperature under the hover should be ninety degrees Fahrenheit for the first two weeks, with a gradual lowering from that on. Overheating is just as injurious and will cause bowel trouble just as quickly as will a chilly atmosphere.

Let me caution readers against buying cheap brooders, for they prove very expensive in the end. Out of the many brooders made and advertised, there should be no trouble to select a good one. Buy the best or none at all.

I have absolutely no use for an outdoor brooder, unless it is to be used indoors, and then I prefer an indoor brooder. Imagine shutting up fifty to two hundred chicks in a brooder three by four feet for two whole days when the weather is stormy, and expecting them to do well.

I have made small houses, six by eight feet, with a window and door in front. In a corner of this house I place



A Vigorous Brood and Their Brooder.

the brooder, and after the chicks are three days old I give them the run of the house. On pleasant days the door to this house is left open and the chicks are given the run of the yard. In stormy weather they are kept in the house. On the floor of this house is four to six inches of chaff and into this the food is placed. At the end of eight or ten weeks the brooders are removed and roosts are put in their place. The young are left here until placed in winter quarters.

For food for the first four weeks I use bread soaked in milk, squeezed dry as possible, millet seed, cracked wheat, and oat groats. After the fourth week cut green bone is fed twice a week in place of bread and milk, and cracked corn alone for night food. Chick grit, granulated bone and dry bran is kept before them at all times. Be careful and do not overfeed. Small chicks will commence to scratch as soon as hungry, and they should be kept at it.

It is needless to say attention to details is necessary to success. Clean the brooder frequently and keep the surroundings in a sanitary condition.

Fresh, pure water should be kept before them. Get the chicks out on the ground as soon as possible, if but for a few minutes every day.

With me the brooder chicks and their care are a source of pleasure, and their attention means a friendship between us which is noticeable when they become adult fowls.

DR. O. P. BENNETT.

THE TEMPERATURE OF THE BROODER IS OF FIRST IMPORTANCE.

We have been raising chicks since 1893 and with the exception of the first year we have raised nearly all of them in brooders. We have at times raised nearly every chick put into them, and again, we have lost every solitary one, with many varied and interesting experiences between the two extremes, but the method with which we have had the best success is that which we here describe.

When the chicks are hatched we have the brooders all ready and warmed to a temperature of ninety degrees, which we consider nearly a perfect temperature (that is ninety degrees in the coolest part of the hover and not exceeding one hundred degrees in the warmest.) We place the chicks under the hover and for one week keep the temperature at, or as near ninety degrees as it is possible to keep it. The second week, if all has gone well, we reduce the temperature to eighty degrees, and after the second week and for as long as the chicks need the heat in a brooder we run it at seventy to eighty degrees, or at whatever temperature the chicks seem to be contented. We consider the heating part of this brooder business of more importance than the method of

feeding, as too much or too little heat will wipe out a whole brooderful of chicks before one is aware anything has gone wrong. Another thing—in the night when there is a change in the weather from one extreme to the other, one will, many a time, save a bunch of chicks by going out and changing the lamp flame, either up or down, as may be necessary. No matter if you are sleepy, if you wish to raise the greatest number of chicks, you must attend to this duty.

As to feeding, we have wheat, oats and corn, equal parts of each ground together, and, with one-third its bulk in bran mixed with water to a stiff mass, a little soda added, and sometimes two or three eggs to a gallon of the food. This we put in a deep pan and bake thoroughly for two hours in a good hot oven. We use this food crumbled fine with a little more dry bran added for the first four days and feed three times a day just what they will eat up clean. At noon, after the fifth day, we feed a little wheat, cracked corn and millet seed until they can eat cracked wheat, oats and corn, when we feed equal parts of wheat and oats, but only half as much corn. After the first week we add a small quantity of green cut bone every week day in the evening food. When they are five weeks old we feed whole grain morning and noon and soft food (not cooked) and green bone at night, until they are nearly matured, when we omit the noon feed entirely.

We keep them in their regular brooders until they can do without the heat; then they are changed to a cold brooder for a week or ten days, and from there to our open front roosting coops. They remain in these coops until they become troublesome to the smaller ones, when we put the first hatched lot in our large pens, separating the males and females.

We give our young chicks unlimited range of an old orchard, except during the first two weeks, when we use a small pen ten feet square around each brooder for fifty chicks. We never put more than that number in one brooder.

For our early chicks, for green food, we use a small amount of clover meal in their food. Young chicks should be placed on the ground just as early as possible after the second or third day. The little chicks in cool weather should be placed in a sunny spot and in extremely hot weather in the shade. Close attention to details and all efforts to make the chicks comfortable are well repaid by faster, better growth.

CLARK & TROLL.

KEEP THE BROODER CLEAN—WHAT TO FEED—HENS BRING LICE.

Yes, I have had some experience raising chicks with brooders. As to the number of chicks to a brooder, I have yet to find one that would accommodate more than thirty or forty chicks for me. There is much danger of over-crowding where more than forty are placed in the same brooder.

Special care is needed to keep the chicks very clean, and the fresher and cleaner the surroundings of the chicks the less liable one is to lose them.

In regard to feeding—I like pin-head oatmeal or rolled oats for the first four or five weeks, with a change to bread and milk or Spratt's patent chick food. An excellent change

also and one that produces growth is fine cut green bone. As to the quantity, I give them what they will eat up clean. I would much rather keep them a little hungry than have them stuffed with food.

I feed about five times a day the first week; after that four times a day till they are nearly grown. Cracked corn, wheat, buckwheat, ground oats and green cut bone is what I give them from six weeks old upwards. I keep plenty of grit before them, also plenty of fresh water in clean fountains or dishes.

When weather permits I allow them to run at will, giving them practically free range. I have five acres devoted exclusively to White Wyandottes and raise about two hundred chicks on the home place. I farm out extra ones on different farms. I find that they do much better in small numbers. It is not how many I try to raise, but how many good ones.

I raise some by natural way, but have to be on the alert for fear of lice. But frequent use of lice killing powders and lice killing paints will keep them down and out. All my weaned chickens are quartered in roosting coops where they get plenty of air and grow fast.

C. S. WETMORE.



The Heater which Feeds the Pipe Systems in a New Jersey Brooding House.

FIVE DOLLARS AN HOUR EARNED BY RAISING 400 BROODER CHICKS.

I had a little experience a few years ago which I think will illustrate the possibilities of chicken growing on a limited area and may interest and benefit some of your readers.

During the latter part of March I got out a hatch of Light Brahma chicks, four hundred and one in number. I kept them in the brooder house for a few days, then, being short of room, put them outside in two outdoor brooders,

inclosing them in a little space of six square rods, inside a wire fence one foot high. I think I have never suffered so small a mortality in all my experience with chicks, losing but three of the whole number and one of those killed by a dog. Those chicks commenced growing from the first and in three weeks' time began to hop over the wire. I hastily placed a four-foot wire around the pen, intending to move them to different quarters when convenient, but they made such a remarkable growth and seemed so healthy, I thought I would see how long they could be kept growing in that limited space. I attended them myself. The yard was swept every day with scrupulous care and the excrements removed. The birds were fed systematically and always kept a little hungry. They never left that yard till they went to market, then weighing from five to six pounds each, dressed, and there was not a cull in the lot. Their plumage

In fact nothing came amiss; they greedily devoured everything I gave them and appeared to have every confidence in my judgment. They brought thirty cents per pound in Boston market, aggregating nearly six hundred dollars, thus paying me for all food consumed and nearly five dollars an hour for all time in caring for them and had they been hatched two weeks earlier they would have brought thirty-five cents per pound. With one exception, this was my most successful experience with chickens.

JAMES RANKIN.

RAISING CHICKS IN BROODERS.

We use both indoor piped sectional and outdoor hot-air brooders. To begin with, our chicks are well hatched and come out strong, plump and active. Very early in the season, when the weather is still cold and frosty and no grass



View Showing the Location of Hovers and Other Interior Fixtures in a New Jersey Brooding House.

was glossy and fine. The birds were gentle and could be taken up at will.

When a little over four months old and about ready for market, I notified Mr. Hunter, then of Farm Poultry, that I had a show for him. He came out the next day and when he saw those chicks he would not believe that they had been grown in that yard, as there appeared to be but little more than standing room for them. He asked my men if I was not hoaxing with him, and he finally acknowledged that they were the finest lot of chicks he ever saw together.

They were fed four times per day till a month old, after that three times. They were started in with bread crumbs and hard boiled eggs chopped fine. One part egg to five parts crumbs and plenty of grit mixed in. After three days their food was equal quantities of wheat bran and cornmeal with a little fine beef scraps, and I gave them one feed each day of rolled oats and cracked corn. As they grew older they had a bucket of clotted milk each day, boiled potatoes and green grass. Toward the last, one feed of whole corn and over one-half bushel of finely cut corn fodder per day.

growing, we use the indoor brooders. These machines are set up, thoroughly warmed and tested before the chicks are put in. The brooder floors are sanded and the house floor covered with chaff or cut straw. During the first few weeks we keep the hovers very warm and if the chicks are too warm they crawl out where it is cooler. At night in particular we are careful to have a good surplus of heat, so that the chicks lie partly outside the hovers, as from midnight to morning the temperature of the room will lower considerably, so the chicks will go under the hover and be very comfortable. Were it not for this surplus of heat when left at night the chicks might be chilled before morning and then bowel trouble would make its appearance and many chicks die. Each room is sixteen by twenty feet and not usually over four hundred chicks to each brooder.

The first few days the chicks are fed granulated oatmeal only, with clean water (not too cold) for drink, and some good, sharp grit before them constantly. The first week we feed four times daily and but little at a meal. We then begin gradually working them on to a diet of cake,

varied with cracked wheat. The cake is made of ground oats (hulls sifted out), cornmeal and best coarse wheat bran, about equal parts by bulk, with a very little high grade beef scraps mixed in while dry. The mixture is then moistened with some milk or buttermilk, salted as for the table, leavened with soda, and baked.

The baking tins should not be quite full, as when the bread is done we turn it upside down on a board so the crust will be softened by the steam. As the chicks grow older the amount of beef scraps is gradually increased. This feeding goes on until the chicks are five to six weeks old, when a warm mash of about the same material as the cake is fed once a day, and whole wheat and cracked corn twice. This mash is moistened with warm water with a little salt dissolved.

Just as soon as we can get fresh clover or grass it is fed daily, cut in one-eighth-inch lengths. Chard, lettuce, beet tops or any such green stuff is also good. The hard grains are fed in the litter to induce exercise after the chicks are older and strong enough to work it out.

When the chicks are ten days to two weeks old and the weather is suitable they are let out in yards about fifty by two hundred feet in size, care being taken that they can find their way to the house when stormy. When they are about eight weeks old the yards are opened and the birds given free range.

When the chicks show a disposition to roost on top instead of inside the brooder, roosts are placed back of the brooder and the chicks encouraged to occupy them, when in a short time the brooder can be removed.

Just as soon as grass starts in spring, we begin putting chicks in the outdoor brooders, and when they are four to six days old we let them out on the ground in small yards in front of the brooder. As soon as they get familiar with going in and out and learn to go inside when the weather is stormy we give larger yards, running entirely around the brooder, and finally when the chicks are three or four weeks old we allow them free range. These chicks are fed same as in the indoor brooders, except that cut grass is omitted, as they help themselves to the fresh, growing article, and the exercise they get in pulling it off and running around the yards is a wonderful aid to growth.

In my opinion an outdoor brooder should have a light, cool chamber attached, where the chicks can feed and exercise when very young, or when the weather is bad, and into which they can retreat in case the brooder chamber should become overheated. Outdoor brooders have some advantages over those indoor, but they require more watchful care. Their greatest point of superiority is that the chicks can be got out on the ground at a much earlier age, and in running about their yard, picking the fresh grass, etc., get much healthful exercise. When the weather gets very hot the outdoor brooder should be placed in the shade, and a shady run provided for the chicks when very young, as the intense heat of the sun kills a great many. When running at large the chicks will seek shade of their own accord.

We like both kinds of brooders, use both, and would not wish to be deprived of either. H. J. BLANCHARD.

THE BROODER CHICK FROM EGG TO MATURITY.

Early in our experience of artificial brooding we became convinced of the fact that the foundation of successful brooding was laid months before the chick was hatched. By this we mean that unless the breeding stock is in the best of physical health we cannot hope for the best results in raising our young stock. Too many of the reasons assigned for the large mortality among chicks are, to say the least, of very uncertain signification, and not enough attention is paid to the poor condition of the breeding stock, which

is, to our way of thinking, the main reason why a larger percentage of chicks do not reach maturity.

Our first attempt at brooding chickens artificially resulted in disastrous failure, but by close observation and many costly experiments, we finally adopted a method which is giving us gratifying results, and we feel sure that those who will try it will be pleased with it.

It goes without saying that the eggs must be well incubated, and every attention given them while under process of incubation. We leave the chicks in the incubator forty-eight hours after they come out of the shell. The morning of the third day we take them out of the incubator and carry them to the brooders, which have been previously warmed for their reception. We then give them their first feed, which consists of whole wheat bread, moistened with milk. We never place more than fifty chicks in each brooder, sometimes only forty. The temperature of the brooders is regulated by the disposition of the chicks on the brooder floor; if well spread out, we know they have sufficient heat, if all crowded in a corner we know they need more heat. That is our thermometer, and a reliable one.

We wish here to relate an experiment we made in order to determine the length of time chicks can be left in the incubator without food. Five chicks were left in the machine, the ventilators wide open, and the heat regulated to 100 degrees. At first it was our intention to leave them in until they showed signs of weakness, but on the fourth day our courage weakened, and we fed them. They had up to this time showed no other signs but that of being very hungry, running to the glass front of the machine upon hearing the least noise. We marked these chicks and let them run with the rest. At maturity two of the cockerels weighed eight and three-quarter pounds each; three of the pullets six pounds, six and one-quarter pounds, and six and one-half pounds respectively. All of them lived to maturity and were always bright. Since then we always left our chicks forty-eight hours without food and believe this to be the very best way to start chickens growing.

Our brooders are placed inside of a house eight by ten feet, with yards eight by twenty-five feet, each brooder occupying a separate house. The floor of the brooder is carpeted with cut clover, but the brooder house is filled in to above the sills with clean, sharp sand. The chicks are left in the brooder for two days, then let out into the house for three or four days, then the slide door to the yard is left open and they are given the run of their yards. When the chicks are six weeks old we take away the fence to the yards and give them the free run of the farm.

For the first ten days of their lives our chicks are fed only whole wheat bread moistened in milk every four hours. Water (warmed in cold weather) is always before them from the start, and is renewed twice or four times a day according to the weather. When the chicks are ten days old we still continue the wheat bread morning and night, the other two feeds are made up of the following mixed grains: Cracked wheat, 50 pounds; coarse oatmeal, 25 pounds; cracked corn, 10 pounds; millet seed, 5 pounds; fine meat scraps, 10 pounds. When fine meat scraps are not procurable, boil some liver, chop it up into fine pieces, and use that instead. Some heresy hunters will prick up their ears upon reading this and criticise us for giving meat to our young chicks, especially when given free range, but we know that it is impossible to grow the finest chicks without the free use of meat, but it must be used with judgment and be of good quality.

At six weeks old we make the mixture of whole grains instead of cracked, still feeding it twice a day, but at this age the bread is replaced by a mash fed morning and night, composed as follows: Wheat, 50 pounds; shelled oats, 25

pounds; pearled barley, 15 pounds; corn, 10 pounds. We buy the grains whole and have them ground up together into a meal. To every 100 pounds of this meal we add 10 pounds of the finest quality meat scraps. We continue to feed our chicks four times a day until three months old, then we drop one meal, and feed only three times a day, mixed grains in the morning and noon, and mash at night. We aim to feed all they will eat at each meal, without overfeeding. Now and again when they do not appear hungry we drop a meal, and they are benefited by it.

At three months old we separate the sexes, giving the cockerels one part of the farm, the pullets the other.

We have said nothing about charcoal, dry bran, tonics and condition powders, simply because they are unnecessary. Grit of course we use and find we cannot get along without it.

While we are painfully aware that our method is not perfect, we cannot overlook the fact that by following it as here described, we have succeeded in bringing to maturity over ninety per cent of all chicks put in the brooders. Our chicks grow steadily from the shell up, our pullets begin laying at six months old always. They have produced two hundred eggs in one year. A good deal of this large egg yield was due to the care given the pullets while growing and after they began to lay, but had they not been bred from layers we could not have reached these results. If only those who decry the practice of breeding layers by the individual record system would try it, they would soon become converts to it. However, the proof of the pudding is the eating of it; give our way a trial before you condemn it, you will be pleased with the results. C. BRICAULT.

FOOD AND CARE GIVEN FLOCKS OF BROODER CHICKS.

As our present plan of feeding is giving such good results we will here give you a description of the care and food given our chicks. We leave the chicks in the machines until the morning of the twenty-second day, taking out the trays the night of the twenty-first day, thus giving the chicks more room and light.

The morning of the twenty-third day the chicks are taken out and put into outdoor brooders and given a breakfast of dry rolled oats, which we feed for a week or ten days. A little chopped lettuce is much relished by the chicks also. From rolled oats we go to a mixed food consisting of a prepared poultry food with a little more rolled oats and meat meal added to it. This we mix up with curdled milk until it will crumble in the hand. This we feed until it is time for whole grain and cracked corn, and we find it is giving grand results. We neglected to state at the beginning that first and foremost the chicks are given plenty of fresh water as well as good food, all of which make chicks grow and keep them growing. Charcoal and fine grit are also among the necessities of proper feeding.

Great care should be taken to keep the brooders cleaned at least once a week, and aired every day.

Our predecessor always used indoor brooders, but he always had a great deal of trouble in keeping the chicks warm early in the season and cool as the season advanced, and the result was the loss of chicks. There is one point in favor of indoor brooders, and that is in rainy weather the chicks have more room, but with the style of brooders we have now in use we have had no trouble on this score, as we only put seventy-five into each brooder, which is but half their capacity, thus giving the chicks plenty of room for different kinds of weather.

Attached to each brooder is a small wire run, where the chicks are let out for a week or ten days, until they get used to going in and out of the brooder, then the fence is removed

and the chicks have free range every pleasant day until they are separated and put in the brooder house and taught to go onto the roost.

We think we have the best plan for young chick roosts we have seen. We use four saw-horses placed at even distances apart. On these we have eleven roosts, four inches wide by twenty feet long, placed about two inches apart. These are fastened to the end horses by boring holes through the slats and horses and putting spikes through both, thus holding them all in position. We find them easy to build, easy to clean and easy to take down and store. These eleven roosts will accommodate from three to four hundred half-grown chicks. Our brooder house is situated in a large pear orchard covering about eight acres; the soil is gravel and sand and is seeded to clover. We also have two living springs, so our stock get plenty of good pure water, lots of shade, ample range, with plenty of insects to keep them busy between meals. GRAY & STORKE.

BROODER CHICKS AND GROWING STOCK—CARE AND FOOD.

It is a delightfully easy thing to tell how to raise chickens. It is not quite so easy to successfully raise them. There is little need for any extended directions for raising chickens by the natural method other than in the points of food and cleanliness, with some little attention to the details of housing and shade. With artificial hatching the business takes on a development and calls for much greater care and decidedly more attention to food and management.

Little need be said of the hatching, except that the best incubators should be used; the second rate cheaper machines being generally unworthy of confidence; that is, the problem of hatching is of sufficient importance that only the very best means to this end should be accepted.

In producing eggs for hatching the very best attention must be given to the breeding stock, and if good results are to be had the birds must be the product of several generations of hardy, vigorous stock.

The strongest emphasis may be placed upon the fact that it is much easier to hatch chickens than it is to raise them after they are hatched, and the first two weeks in the little bird's life is a crucial period, and under some conditions the second two weeks is harder to tide over than the first fortnight, yet with due care and proper attention to the warmth and food they may be and are successfully carried to an age after which death is generally the result of accident rather than ailment or disease.

What they shall be fed when taken from the machine at the expiration of twenty-four or thirty-six hours is a question which has exercised the mind of every producer of chickens. Every conceivable sort of food has been suggested, recommended and tried in more or less cases. We believe that the simpler the ration the better the chicken and the surer the success in its raising. All fancy mixtures and fussy feeding notions may safely be eliminated. The oldtime mixture of boiled eggs and cracker crumbs is now-a-days pretty generally neglected. In some instances breeders are using this mixture successfully, but in more cases they are killing their chickens apparently by its use. We have tried practically every system from the egg and crumb diet to that of dry food alone, including baked cakes, bread crumbs and various oat foods and so on, et cetera, et cetera, and have gradually simmered down to the point where we now feed exclusively for the first two days a mixture of two-thirds wheat bran and one-third Indian meal moistened with milk, and to this we add about five per cent of fine gravel or grit. The chickens are fed all they can eat, in fact it is before them practically all the time for the first forty-eight hours, and from then until a week or two of age

there is very little of the time when food is not within reach. After the first two or three days they are fed in addition finely sifted cracked corn and rolled oats, chopped oats, cracked wheat or, in fact, any grain or food which they will eat. We conclude it makes very little difference so long as they have a fair proportion of animal food, which, with us, is in the form of ground beef scraps, and it may be just as well or better in the form of milk, either sweet or sour, skimmed or whole. When milk is fed to very small chickens it is better to moisten their food with it than that they have it to drink. If they have it as a drink they are quite apt to smear themselves with it, making them sticky and dirty, and both ill-feeling and ill-looking. After the first three or four days the grit is left out of the food, a supply being kept constantly within reach, which they eat as they require it. The warmth in the hover is started at ninety-five degrees, with the chickens all in. From that it is gradually lowered, more attention being paid to the action of the chicken than to the temperature as registered by the mercury. When the chickens are comfortable and settle down contentedly without over-crowding or pushing too much to the outside, it is concluded that the conditions are right and they are doing well. When, on the other hand, they crowd and cry, not enough heat is supplied, and we give them more. It is impossible to give small chickens a satisfactory treatment where the brooders are run altogether by the thermometer, regardless of the outside weather conditions, and the indications of comfort, which may be observed from the chickens themselves. The brooder floors and pens should be scattered with chaff or covered with sand to induce action and exercise through scratching and working for particles of dry food, which may be thrown about in the litter. The one thing essential to the health of the chicken is abundant exercise. Without this they will not thrive, and success cannot be attained. In order to get the necessary exercise it is imperative that they have an abundant supply of fresh air and an outdoor run at all seasons of the year. A few minutes in the open air will do the smallest chicken good, and after they are a week or ten days old they may be trusted to run back and forth in pleasant weather almost regardless of how cold the outside temperature may be. Fussy coddling and over-heated compartments have been responsible for the death of more chickens

strong, healthy chickens having abundant exercise and a good supply of fresh air will stand almost any sort of food without taking harm. The main thing is to get the exercise. It perhaps might be noted here that this is practically the secret of success in managing breeding stock as well as chickens.

Clean water should be always within reach of the chickens, and it should be kept in some such fountain as will make it impossible for the little birds to get into it. This will save frequent drenching and occasional deaths by drowning.



An Even Half Dozen—Just Out.

In extremely cold weather it is better that newly hatched chickens should have luke-warm water than that it should be given to them icy cold. Many breeders do not give the little chickens any water until several days old, some even keeping them several weeks without it. We have not thought it the best way, and we give water from the first. From their very evident pleasure in drinking, it must taste good to them, and we doubt any possibility of harm from drinking over much clean, pure water.

There is a good deal of question what the limit is in the numbers that may be kept together safely. Many advocate fifty as the best limit, while others keep from one hundred to two hundred in the same pens and under the same hovers. There is little doubt that for the beginner, at least, flocks of fifty or sixty will do better, and there will be a lower death rate than in flocks of one hundred and upward. We have built our brooder building with the pens three by ten feet, which are designed to accommodate from fifty to seventy-five small chickens. They will easily hold fifty chickens until six weeks of age if the chickens have an outdoor run. They are then put in a pen four by ten feet and kept until feathered out, when they are removed to colony houses of one description or another. Of course the early

hatched and winter chickens must have heat practically throughout the winter.

Late birds do very well without artificial heat after the last of March, and may be safely colonized in suitable coops at a few weeks of age—almost every kind of coop is used for this purpose, and it really matters very little what the style of the structure be so long as it conserves the essential features, which are dryness and freedom from direct draught. For some years open front and bottomless roosting coops have been strongly advocated as being the best fitted for growing chickens colonized in groups of from thirty to fifty. Our experience has led us to do away altogether with open fronts and coops without bottoms. There is a constant trouble from colds caused either by driving rains or



An Ideal Place for Brooder Chicks on the Plant of Mrs. H. W. Hand.

than any other cause. Whenever trouble appears in a flock of chickens the first question with the average beginner, and sometimes with the more experienced person, is what their food has been. The attention and investigation is generally directed toward the food. The facts are that the

bunching up on the ground, thus drawing up the dampness, which ends in running nostrils, wheezing and general debility.

As the chickens grow older they are fed rather differently. They have their regular morning feed, with one at

noon and another at night. Generally the morning and the night feed are mashies composed of bran and meal of about equal parts, with from ten per cent to fifteen per cent of beef scraps added. Oyster shell and grit are always by them, and green food is supplied as abundantly as is convenient. Where the runs are large enough so that the green food is not eaten down, no other need be given, but in yards devoid of grass some substitute will have to be added to the grain rations. In addition to these regular feeds three times a day many of the most practical and successful poultrymen keep a box of cracked corn open to them, from which they may eat at pleasure. Many also keep a box of coarsely ground scrap, which is kept constantly filled and which may be had at all times.

As the chickens gain in size and the cockerels mature they are separated from the pullets, leaving from twenty-five to thirty-five or forty pullets in a flock. The cockerels are removed to another yard and, if designed for market birds, are fed all the fattening food which they will take, and as fast as they are in fit condition they are sent to market. The earlier hatched pullets should not be fed quite so much meat or animal food as the later hatched ones, or they will begin laying too early and will molt out in the fall, thus jeopardizing the supply of winter eggs. It is possible by forced feeding of animal food to induce very early laying, and we this season, without extra heavy strain, have started our Wyandotte pullets to laying at four and one-half months, which is too early to get the best size on the birds or the best results in constant egg production. Too early maturity is as much to be avoided as too late, that is, the pullet which grows along freely and gets a suitable frame and size before beginning to lay will make the strongest and most vigorous breeding bird and will in the end prove the most profitable.

We feed very little whole corn, as the cracked corn gives them more exercise in scratching and feeding, and does not pack so closely together in the crop. Considerable shelled and whole oats are fed, together with some wheat; the wheat, however, is more sparingly fed on account of the extra cost. We are able to get the same growing value from wheat bran and beef scrap at a much less cost

very little difference and that the chicken that is properly fed and is in the right condition will be good to kill for broilers without any extra preparation, and chickens which are good broilers will, if kept, mature into good roasters. One of the really necessary things to do is to get rid of about nine-tenths of all the accumulated wisdom which has



A Flock of Future Money Makers.

been loaded on to the chicken business, in many cases until it has nearly swamped it, and to get back to a few very plain principles. These briefly stated would be, sufficient warmth, cleanliness, plain food, and plenty of it; these, together with a good range, will produce chickens at a satisfactory profit, if the breeding stock has been properly selected and bred.

One of the very necessary points is good shade, and it must be had in some way, either by trees, boards or brush sheds or otherwise. We have killed two birds with one stone, or rather saved several birds with one idea by building a number of houses on posts, which leaves them elevated about twelve inches or fifteen inches from the ground. These coops are floored, which keeps the birds high and dry and free from dampness, and at the same time allows them sufficient shelter from the sun and the draught which is generally found nearest the ground, and on rainy days they bunch together under the buildings and enjoy themselves much better than they would were they obliged to stay inside. A board runway leads from the chicken door to the ground, giving them convenient passage to and from the inside. Since we have adopted this

method of keeping the chickens we have had very much less trouble from colds and greater thrift than by the former method of colonizing in open front coops without floors. These coops are built four by eight feet and are four and one-half feet high in front and three feet at back, giving a sharp pitch to the roof, which sheds the water readily. They are covered with tarred paper and have one sash, six lights, nine by twelve inches, and a door twenty-four inches wide, and full height of the building, which is fitted with a screen for hot weather. The birds may be carried in this building through the winter if necessary, and before the chickens are large enough in the spring to be placed in them they are used for breeding pens and are very convenient for this purpose.

These buildings are, as are all other quarters, inhabited by chickens, thoroughly disinfected at frequent intervals, with a solution of carbolic acid and water. Care must be exercised that too much carbolic acid is not used immediately before the chickens are shut in for any length



Making a Good Start.

than we can get it from wheat, of which the best grades only should be fed. Smoked and damaged grains, such as are commonly on sale for poultry, are unfit for this purpose.

Very many fancy formulas are to be had for broiler feeding as distinct from roasters. We believe there is really

of time as too much acid is quite fatal to small chickens. Any high grade disinfectant would answer the same purpose, the idea being to keep the house free from disease germs and to help the sanitary conditions.

G. H. POLLARD.

BROODER CHICKS—FEED AND CARE.

I want to tell you of my mode of feeding and caring for chicks. After the chicks are hatched I leave them in the machine at least twenty-four hours before placing them in the brooder. This makes them strong and vigorous. As soon as they are placed in the brooder I give them sand or fine grit and water. I keep water by them all the time, good clean, fresh water.

My first feed is hard boiled eggs chopped up fine. After that I feed millet scattered among the chaff that is on the bottom of the brooder and run. I feed both millet and hard boiled eggs at intervals (just what they will clean up and work for) for the first week, after that I give them a feed of cooked rice (cooked dry) for a change, also cut oats and corn bread. As the chicks grow older I add whole wheat and also feed some mash with a little blood meal in it about twice a week. One of the great points in feeding and care of chicks is "common sense and judgment." Study your brood and you can see at a glance how much and what to feed to supply their wants.

I remember one season I tried not feeding any food or water for the first forty-eight hours, etc. Well, the result was I lost all the chicks. As brooders (the leading machines) are nearly all properly constructed it remains for the operator to do his or her part, which if done there will be no trouble. I rear and have raised by farmers from 1,000 to 2,000 White Plymouth Rocks every year, and must say if the farmers follow the above method of care and feed we lose but few chicks.

U. R. FISHEL.

THE VALUE OF EXERCISE, LIMITED FOOD AND EVEN TEMPERATURE.

Our experience with brooders has been somewhat varied and not all "clear sailing" by any means. We had some very disheartening times while we were getting our "experience."

The poultry journals are full of advice regarding the operating of brooders. These methods sometimes seem directly opposed, and still, no doubt, they are the truthful experience of the writers. We believe that the greater number of failures with brooder chicks are caused by too much heat and overfeeding. We do not believe that brooders can be run successfully, generally, in cold weather without the use of thermometers. Chicks taken directly from the incubators and placed in the brooders will stand a far greater amount of heat than is good for them. Consequently if we judge altogether by their actions we may keep them at a much higher temperature than is good for them. This is reasonable, for we can so accustom a child to a high temperature that it will be uncomfortable in a room under ninety degrees, and none will deny that this amount of heat is injurious to the child. Ninety degrees three inches from the floor in the hover of the brooder is about right for the first week. This should be reduced gradually to eighty-five degrees the second week and to eighty by the end of the third week.

We have killed a whole lot of chicks, both in brooders and with hens, with kindness, i. e., with too much food. Now, we never feed oftener than three times a day from the

very start, either with brooders or hens. This way works well with us and we shall stick to it. The danger of overfeeding with brooder chicks is especially great, as they do not and cannot take as much exercise as those with hens. Don't worry if they get hungry enough between meals to scratch good and hard. This is the making of them. It will help digest their food and ward off diarrhoea, which is only the result of indigestion.

All brooders should have an open runway or yard, and the chicks should be accustomed to running in this for at least a short time from the very start. Give fresh water to drink from the first. Keep fine grit in the brooders all the time. Keep the temperature right; have them take plenty of exercise; feed only three times a day, and "what you feed" will not be so important.

We are very partial to millet seed. In fact we have said that we could raise chicks on this alone, with water and grit. Equal parts of corn meal, bran, shorts and clover meal, baked with soda or baking powder, makes a good winter feed. Stale bread, soaked soft and squeezed dry, is an excellent food for starting chicks. Put chaff in the yards or runs and sprinkle just a little millet seed in it and watch them scratch for it. This is our way, no theory, all practice. If your way is different, and you are successful, stick to it.

W. B. GIBSON & SON.

FEEDING THE BROODER CHICKS.

I have used several kinds of brooders. I first began with outdoor brooders with bottom heat, but had little success, but that was about twelve years ago, before brooders were as well perfected as at the present time. For a while after that I hatched with incubators and brooded with hens and since have used top heat indoor brooders with success.

The brooder with which I have had the greatest success is one having a hot water pipe system, and with this I can raise a larger per cent of the chicks hatched than with hens, and the same number with much less trouble and expense.

I feed chicks after they are about thirty-six hours old, once every two hours through the day till about four weeks old. No one need fear that any food is too fattening for young chicks. They need carbonaceous or fattening food to keep them warm while they are small and to sustain their vigor during the period of rapid growth. There is no one food which is as good as cornmeal, either in mush or bread, but I think a variety of foods is better than any one alone. A very excellent food for chickens is bread made from two parts corn meal and one part wheat middlings, with two tablespoonfuls of animal meal added to each quart of the mixture; this stirred to a stiff batter with sour milk, in which enough soda has been dissolved to make it light, and baked in thin cakes to be fed warm or cold. This bread may form the main food till the chicks are large enough to eat cracked corn, broken rice and small grain and the bread may be supplemented by hard boiled eggs chopped fine, and other palatable foods. I save the infertile eggs from the incubators to boil for the chicks. After they can eat small grain foods I feed a mash once daily of the same meal mixture as described for bread, and a variety of grain foods, such as steamed rolled oats, wheat and cracked corn, plenty of oyster shells and grit, and clean fresh water, give access to a good grassy run, and a clean brooder. In short, to get the best results, chicks should be kept steadily growing from the time they leave the shell till they are fully matured. As they grow older they require proportionately more of the bone and muscle forming food and less of the more fattening materials.

The best way to care for the brooder is to clean it every

morning and put clean sand on the floor to absorb moisture and to ease the chickens' tender feet from the hard floor.

GEORGE H. NORTHUP.

CARE OF BROODER CHICKS—COLONY COOPS AND NEW GROUND.

After many years with Buff Cochins we have almost adopted and believe the saying that, "If you hatch ten Cochin chicks and a board does not fall on them, you are almost sure to raise the whole ten." A good brooder, proper food, pure water, plenty of shade and green grass, freedom from lice, and the proper attention, will make Cochin raising the simplest thing in the world.

Our chicks are hatched both by hens and incubators, and we find absolutely no difference in the chicks, with the exception that those hatched by incubators are free from lice.

It is almost impossible to raise to maturity chicks from unhealthy and improperly cared for parents. It is equally impossible to raise chicks that have been improperly incubated, whether by hens or incubators.

It is just as probable that you will get improperly incubated chicks from hens as from incubators; for how often do you see a poor, run-down, emaciated hen bring into existence a flock of chicks when she is so weak, poor, and run-down that she is barely able to stand. This is not the fault of the hen, but of the failure of the proper attention having been given her. One can readily understand how impossible it would be to start and develop into active and vigorous life chicks that have been brought into the world under such unfavorable circumstances. Therefore, our first aim is to get our chicks from healthy, well cared for parents, and then to have them hatched under the most favorable conditions.

When the chicks are hatched we leave them under the hen or in the incubator at least twenty-four hours. If they are taken out sooner than this, they are not so strong, and the chance of raising them is much lessened. They are then given a thorough dusting of Persian insect powder. This is very important, as they cannot thrive when lice are present.

We raise our chicks in outdoor brooders, using two hundred chick size, and put from forty to fifty chicks in each brooder. The brooder is gotten clean and is heated to ninety degrees the day the chicks are due to hatch, so that everything is in readiness for them. They are given plenty of water at once, and their first food consists of fine dry rolled oats. During the first ten days they are fed exclusively on rolled oats and millet seed. They are fed six times a day, alternating with rolled oats and millet. On the tenth day, they are given in addition to the rolled oats and millet, well baked corn cakes, chopped fine. If they become droopy we add to and mix thoroughly with the corn cakes some finely ground prepared grit. This is the only medicine little chicks need. It is surprising to note how quickly they brighten up on this treatment. When three weeks old we gradually add to their rations cracked wheat and finely cracked corn, cutting out the rolled oats. We continue to feed the millet and corn cakes in conjunction with the cracked corn and cracked wheat until they are six weeks old. We then cut out the millet and corn cakes and substitute hulled oats and American poultry food. The American poultry food is given at noon, and to this is added twice a week fresh ground green bone.

We believe in feeding frequently and in small quantities at a time, as overfeeding is sure to make chicks dull and stupid and eventually bring on indigestion and inflammation of the crop. In giving the different rations we alternate and change as much as possible in order to keep them from tiring of any one ration. We give them fresh water

twice a day, being very careful to keep the same in the shade. As we use outdoor brooders we are able to have them constantly on the move and thereby give the chicks pure fresh earth and grass.

It is very important to provide plenty of shade in summer. It is equally important to place the brooder for one hour each day, while open, where it will be subjected to the direct rays of sunlight, as this method and cleanliness are the only means of preventing the origin and spreading of tuberculosis, which is sure to occur in a close, crowded brooder, especially if dark and damp.

When the chicks are first put into the brooder they are confined for from one to three days, the length of time depending on the state of the weather. The brooders being placed on a nice green grass plat, we then provide for each brooder, one hundred yards of wire netting, one foot wide, with one inch mesh. When the chicks are first liberated from the brooder we drive stakes into the ground and make a coil enclosing about three square feet of space. As the chicks become more active, and readily cover this space, it is gradually enlarged from week to week, until the whole hundred yards are in use. This method has saved us lots of worry and trouble, for when the chicks are young and are first liberated, if given too much space they are almost certain to stay away from the brooder, and it is very difficult to teach them to return to it. Then again, brooder raised chicks have no mother to look after them and in case of a storm they can be very readily found and driven to a place of shelter. We have found that it is not so much the size of the run that makes healthy chicks, but it is the frequency with which they are changed from old to new quarters.

When they weigh about one and a half pounds or are nicely feathered, we divide them into lots of twelve each, being careful to have each lot the same size and development. These are placed in colonies, each colony being all cockerels or pullets. Each colony is provided with a coop four by five feet, three feet high in front and two feet in the rear. These coops are provided with a storm door, and also with another door covered with fine mesh screen. This latter door is used on warm nights, and protects the chicks from vermin, etc., and the outer door, which is hinged at the top, is lowered about one-third, which protects the chicks in case of storms during the night. The bottoms of these coops are covered with a thick bed of straw. This is to prevent the breast bones of the chicks from becoming crooked, which is very prone to occur with Cochins. We never provide them with roosts until they are one year old. When they are eight months old they are provided with more commodious quarters, and those showing promise of becoming choice exhibition specimens are cooped either in pairs or singly with the object of preserving their massive foot and leg feathering.

A. W. RUDY & SON.

LIMIT THE NUMBER OF CHICKS IN BROODERS.

The most successful way that I have found to raise chicks in brooders is the following: Build a brooder house for each brooder, say about six by eight feet, with a door and a window to the south. Have these brooder houses scattered about the orchard, about one hundred feet or more apart, each house to be furnished with a one hundred-chick brooder. In this put from fifty to seventy-five chicks. It is not advisable to put more than seventy-five chicks in any brooder, fifty would be better, as I find that I usually can raise more of the chicks when I only put fifty chicks in a brooder than when I put in seventy-five or one hundred, besides you will have stronger and healthier chicks at maturity. I have no yard for the chicks, but give them free range. I do not let them run out until about a week old,

after which I let them run out on all fine days, but always keep them in until the dew is off the grass, at least until they are well feathered. If this is done you will not have much trouble with gapes. Begin feeding when chicks are about twenty-four hours old. For the first few feeds I find nothing better than bread crumbs. Feed the first week about four times a day with bread crumbs and oatmeal. After the first week, when I let them run out, I feed three times a day, soft food in the morning and either oatmeal, cracked wheat, cracked corn or millet at noon and evening. Change about from one kind to the other and then the chicks will always have an appetite. When chicks are four or five weeks old I feed only twice a day. Feed whole wheat and corn just as soon as they can eat it. Always have plenty of grit standing around for them, and give them fresh drinking water. Keep the brooders and brooder houses clean and look for mites each time you clean brooders. Saturate the sides and bottom of the brooders with coal oil once in two weeks, and then the mites will not trouble you.

The foregoing is for chicks raised on a farm where there is plenty of range. I also find that farm raised chicks, as a rule, make stronger and healthier chicks at maturity and ought to be sold at better prices than those raised on small city or town lots, but they seldom are. You find that city breeders always ask double the price for their inferior stock, although it is no better than that raised on the farm. The best chickens for either the show room or for business are those that are raised on the farm which have unlimited range.

EMANUEL SCHEIBER.

BROODING AND FEEDING CHICKS.

In raising chicks in brooders the first thing to be considered is the brooder. A brooder should be used that will give the chicks plenty of warm fresh air. Some people have the erroneous idea that air must be cold in order to be fresh, which of course is false. A brooder may be so ventilated that the outside air is sufficiently warmed before reaching the chicks. Due attention should be given to see that it is kept at the right temperature, for if the temperature be kept too low or too high for a considerable length of time the result will be an unnatural growth of wings, and weak and sickly chicks. The chicks should be kept so that they will lie down and go to sleep and not be obliged to huddle together to keep warm, neither be forced to the coldest corner of the brooder to cool off.

Another thing to be considered is the number to be placed in one brooder. The brooders that I use are two and one-half by three feet, placed in one end of coops, which are three by six feet. Such a brooder will accommodate seventy-five chicks nicely; we have raised more than that, but that number or less is better.

After the right brooder, with the right temperature and the right number of chicks, is obtained, the next thing to be thought of is the food and drink.

There are many different methods of feeding, many of which we have tried with good results, but perhaps as good, if not the best method of feeding, for the first four or five days is oat flake and millet, with a few bread crumbs fed four times a day. After that gradually work them on to a mixture of cornmeal, wheat middlings, and wheat bran, with a few beef scraps for their mixed food, and cracked corn and wheat, which should be given after they have eaten their mixed food. Close attention should be given to the droppings, and if they do not become hard in two or three days a little black pepper may be mixed with bread crumbs moistened. Care must be taken that none of their mixed food be sticky or gummy.

Another and perhaps one of the most important things

to be looked after in raising chicks is their drink. They should have fresh water placed in clean drinking fountains. A fountain that cannot be opened and cleaned never should be used, for a slimy substance will form on the inside of the fountain and unless removed will surely cause bowel trouble. Many persons have lost nearly all their chickens from this cause and then wondered why they are not successful. If by reading these suggestions some of your readers are helped in their struggle to make poultry pay I shall feel repaid for my effort.

A. A. HARTSHORN.

BETTER TOO MUCH HEAT THAN TOO LITTLE.

How easy to rear young chicks if we only knew what to feed, how to feed, when to feed, and how much to feed, and a thousand other hows, ifs and ands.

In our years of experience in rearing chicks in brooders and by mother hens we find the results about the same in regard to the number raised and cost of food. But chicks reared in brooders are more peaceable and quiet and much more easily handled, hence make better show birds. We also find that we are not troubled so much with lice and disease, for the simple reason that remedies are more easily applied. Again, we have the use of the hen in the breeding yard, and save the food which she would eat if left with the chicks. This is a large gain in rearing thousands of chicks per year, as the food for young chicks is quite costly.

Our method of raising chicks in brooders is as follows: After leaving chicks in the incubator or under the hen until twelve or thirty hours old, we place them in the heated brooder, with the thermometer registering ninety degrees, allowing the temperature to fall until the chicks are three weeks old, after which we use no artificial heat.

In regard to pen room, I have raised as high as two hundred chicks in brooders four by eight feet, and one hundred and sixty-five chicks in brooder three and a half by six feet, and lost only one chick (and that one in the small brooder) this season. We never have had as good results with small brooders. We leave our chicks in brooders the first two or three weeks according to the weather, and give them a run in the yard ten by twenty feet, until six to eight weeks old, after which we place them on the farm. After trying many experiences with good as well as poor results, we find this the most successful of all, with no extra trouble or expense. Any one can rear a brood of chicks in this way.

We offer a few suggestions in regard to feed and heat while chicks are in brooders and small yards. If you wish to avoid bowel trouble, give clabber milk once a day. We have learned this rule: Better have chicks two degrees too warm than one too cold. When chicks are too warm they will scatter over brooder and when too cold will crowd over one another, smothering weaker chicks.

We always feed one teaspoonful of sulphur in food to fifty chicks, twice per week during dry weather. This we think aids the feathering.

IRA T. MATTESON.

HOW TO SUCCESSFULLY RAISE BROODER CHICKS.

One of the first things to be considered in raising brooder chicks successfully is the parent stock, which must be in perfect health, properly fed and given abundant exercise to insure fertile eggs and strong chicks. A first-class incubator must be selected, one that will hatch from 75 to 90 per cent of fertile eggs, and when you get such hatches you will get strong chicks that will live if properly cared for. The next thing to be selected is a brooder, and this is equally if not more important than the incubator. You must get a brooder that imitates a hen as closely as possible; one that will let in any amount of fresh air; one that has a round cylinder with no corners for chicks to crowd in, and one

easily heated with a lamp that will not blow out nor smoke. I prefer the single brooders to the pipe system. In winter heat your house to 60 and 70 degrees and keep your brooders 90 degrees at the start, gradually lowering the temperature after twelve days. Do not let the chicks get chilled at any time nor allow them to crowd, for if you do bowel trouble will be the result, which will take off a large per cent in a short time. Too much heat will weaken them and cause many to die, so you must be very careful, especially at night, about obtaining the right temperature, as it often grows very cool the latter part of the night, so a little extra flame should be left on in cool nights.

I use runs five feet wide, ten feet long inside of house, and outside runs fifty feet long well shaded in summer.

The next and most important of all is food. I wish to say right here that overfeeding for the first four weeks of a chick's life has put more people out of the business than all other things combined. You can hardly feed too little. We feed four times a day for the first five weeks. The first three weeks we use principally dry food and make them scratch for every meal but that given at night. We feed prepared dry chick food morning and night. At ten and two o'clock we feed millet seed, pinhead oatmeal and cracked wheat. We keep them well bedded with cut clover two or three inches deep, and throw all their food in this. They also eat much of the clover. We feed very sparingly at first. Keep them hungry at all times. Much depends on keeping them at work; it assists in keeping them in good health. We keep grit and charcoal before them all the time, and fresh water is always before them. Care must be taken to keep their drinking dishes free from slime; they should be washed daily. Clean your brooder every other day if you bed with cut hay, and every day if you use sand or bran.

After three weeks your chicks will begin to tire of this feed, then we give two meals a day of soft food composed of one part stale bread soaked in water, or better, milk, one part bran, one part hominy meal, ten per cent finely ground meat. The same mash with ten per cent good beef scraps is a grand growing food and much more easily prepared, but more expensive. We continue feeding chick feed once a day for two weeks longer, giving mash morning and night, using cracked corn and wheat once a day. If running for broilers make your mash one-half cornmeal. We run but fifty to sixty chicks in one lot, as this is enough for any single brooder if you want them to live.

After they are old enough to leave the brooder and you cannot give free range make yards twenty feet wide by one hundred feet long and put sixty to seventy-five in a flock on grass yards with plenty of shade, dividing the pullets from the cockerels. Keep them free from lice and you will have birds of fine quality for breeders. EDGAR BRIGGS.

PRINCIPALLY A QUESTION OF MOISTURE.

"I can hatch the chicks easily enough, but to raise them is the question." This expression is very frequently heard from those raising poultry by artificial methods.

I have done a great deal of experimenting along this line during the past eight years. Some seven years ago I thought I had struck the right idea for brooding young chicks when first hatched. I had three separate houses, 7x12. I built flues on each of these houses and put indoor brooders in them, also a small stove. Now, for the results. The chicks did fine for about a week and I thought now I am on the road to success, but, lo! I went to feed them one morning and a number of them looked like big toads swollen to nearly double size. I removed the stoves and the trouble stopped. I then worked along a few years with in-

door brooders and cool, dry houses with varied success. In 1899 I commenced with outdoor brooders. This season I have used nine of them, raising some broods nearly to a chicken, while losing some broods almost entirely—all losses except a few with the universal disease, bowel trouble. Those brooded with hens occasionally died in same proportion. I concluded from observation that it was moisture and not the food that caused the trouble, as I noticed if the weather was dry whether the temperature was high or low I raised about all the chicks, and also if I got them by the first ten days without bowel trouble they were all right. To satisfy myself that it was moisture the first week or ten days that gave them bowel trouble I put several hens with chicks up in a loft for a week. It was perfectly dry in this loft and I never lost a strong chick after this experiment. From this experience I shall construct a room in the loft of some of my buildings next season with plenty of light and ventilation without fire except in the brooder and keep all incubator chicks up above the ground for the first ten days.

A good many perusing this article will say, "He has not said a word about food." I don't expect to say much about food, as it is immaterial what you feed if you solve the moisture problem. I can raise every chick hatched, as I have done it, on the same food I feed old fowls when there is no moisture to contend with. Give the chicks plenty of grit and clean water, a little green food and you can safely feed them any food you may have, if you keep them free from moisture the first two weeks of their lives.

As to space required for brooder chicks, of course the more the better. With my outdoor brooder chicks I use three boards, making a triangular yard, the sharp angle coming up to the brooder, using two sixteen and one twelve-foot boards one foot wide. I keep them in this yard with plenty of chaff to scratch in until they get large enough to fly over the board. Then I cut small openings in the boards for them to go out and in at will. If you have limited space this yard will accommodate probably forty until near frying size if you are careful about sanitary conditions. I am enabled to put forty to sixty in brooders three feet square, and keep them in these at night until frying size is reached. I then cull and run them in a movable brood house until four or five months old, gradually moving the brood house nearer to permanent house, and finally moving brood house away. O. E. SKINNER.

CARE OF BROODER CHICKS.

It might be of some advantage to some of the readers of this book to know how we raise brooder chicks. While I have never raised brooder chicks extensively I have been very successful, raising from 75 per cent to almost every chick. At one time, out of a hatch of seventy-nine chicks, I raised seventy-seven to maturity.

These birds were brooded in a home-made brooder heated with hot water put in gallon jugs, using two of them. I used flannel strips tacked to common laths resting at each end on a cleat nailed to the side of the hover. I use a broad board for a partition dividing the brooder into two compartments, cutting a small opening in the partition board for a passway for the chicks to the run. This part of the brooder has a glass in the top about 16x24.

These birds were hatched about March 1st. The first thing we do with our chicks after hatching them is to place them in small baskets with some flannel cloths in them, wrapping up good and warm—keeping them in that way until twenty-four hours old. By that time I have some fresh corn bread baked just as we use it for our table. Before feeding them I place them in the brooder, which is now heated up to a temperature of about 85 or 90 degrees. The

bottom of the brooder is covered with coarse sand, which I allow them to work in about an hour or two before feeding—then I feed them the corn bread crumbled up fine, putting it on the floor in the sand. By this time the little fellows are getting hungry (having absorbed all the egg food that nature has left for them from the egg) and they begin to eat the little bread crumbs and sand with a pretty good appetite. Only feed them a little. In about two hours or more I put in a little more of the corn bread, and so on, feeding four or five times the first few days. When they are three days old I give them a little warm water to drink, but not much. After drinking I take out the little water pan, and again in the afternoon give them a little more. When three days old, I boil an egg thoroughly done until the yolk crumbles and feed them that, changing off with the bread crumbs. After four or five days old I begin to feed them a little rolled oats or fine cut oatmeal and some small bits of meat reduced small enough so they can eat it. Now I vary feed quite a little. Feed boiled potatoes, oat meal, corn bread, chopped onions and potatoes, ground corn and whole wheat. When two weeks old I feed them ground corn mixed with bran and shorts, one part corn to two parts bran and shorts. I pour hot water over the mixture, scalding it, but only enough to mix it in a stiff or crumbly mass and feed when cool. I never feed wet and sloppy food, as it creates bowel trouble. We aim to keep our chicks in medium small runs until feathered out, then we give them a good deal of range until about half grown, and then I turn them out to all the range they want, allowing them to go at will over the farm.

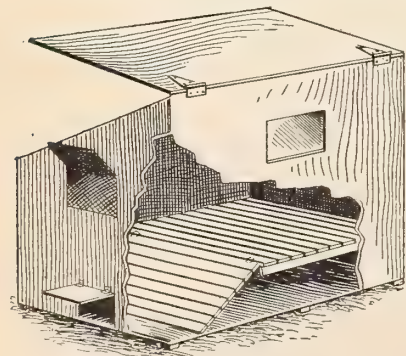
After chicks leave the brooder I divide them into broods of fifteen to twenty to each coop, giving them plenty of fresh air at night, except when it is cold, then close brood coops up so as not to chill them. There are lots of good brooders made, and if properly run they are a success.

There is a great deal in keeping the proper heat for the little fellows, and proper food and regular attention. Never allow your chicks to get chilled if you can help it, and after the second week don't let the heat in the brooder run over 80 degrees, and at night always see that the little fellows are snug under the hover, and when you feed always leave them a little bit hungry, and the next time you come to feed them they will all be glad to see you.

C. B. SAYERS.

BROOD COOPS AND METHODS OF BROODING.

In answer to your letter asking me to give my experience in raising chicks with incubators and brooders and my

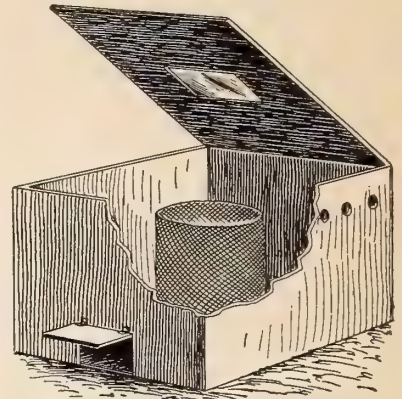


Home-made Brooder Coop.

way of feeding young chicks, I may say that I have had experience with incubators and brooders in a small way only, as it is quality not quantity that I have been striving for the last fifteen years. I try to mature only about five hundred birds each year, and those as good as possible.

The first forty chicks I hatched I put in a brood house nine by sixteen feet, with a partition across the center, giving them one-half of the house. Attached to this house I have two yards, one for each part of the house. These yards are nine by sixteen feet each, and I keep them dug up for

the chicks to scratch in. Next to these yards I have a grass run, and as soon as the chicks have been in the house a few days I give them full range, always feeding and watering them in the yard or house. They soon get used to the place and will go in and out themselves. In this house I place a home made brood box about three by three feet, and two feet high. At the side of the box down near the bottom I make a small door for the chicks to run in and out. The top I use as a door, hung on leather hinges, with a small pane of glass in it to admit light. This lid I raise and lower for ventilation. In the center of the box I place a



Home-made Brood Box.

wire screen about the size of a peck measure, and the first night or two, or any night that the weather should be cold, so that there might be danger of the chicks crouching or piling up, I place a lantern in this center screen.

When my second hatch of one hundred and one chicks were three weeks old I took them out of my brooder again to make room for the third hatch, which I found this time to be one hundred and two chicks from one hundred and nineteen eggs. The second hatch of one hundred and one I put in the other half of the brood house and handled them the same as the first lot. I found when I took the second lot to the brood house at three weeks old that I had lost two chicks, leaving ninety-nine strong, healthy chicks. The two hatches that I put in the brood house were put in the last of April and the first of May, and until the time of this writing (July 12th) I have lost but one chick.

The third hatch of one hundred and two chicks at three weeks old I took out of the brooder again to make room for the fourth hatch, which proved to be one hundred chicks from one hundred and twenty eggs.

The third hatch of one hundred and two and all chicks hatched at this time of year at three weeks old I put outside in a home-made brood coop made three feet wide, five feet long, four feet high on high side and two and one-half feet high on low side. The whole top I hang on hinges, and use it for a lid or door. In the center of high side I place a pane of glass so as to open and shut, with a wire screen over the inside of opening. In each end of the coop up near the top I leave an opening covered on inside with wire screen. Over these openings on the outside I hang a lid to open and shut for ventilation, which, when open, forms a roof to keep out the storm. In one end of coop down at the bottom I make a small door for the chicks to go in and out, and in the other end of coop I place a brood box made the same as the one described for the brood house, and when the chicks are old enough I take out the brood box and put in place of it a roosting rack made out of slats placed a little way apart, so as to admit air from the bottom. This rack is made so as to fit in one end of the brood coop on cleats nailed to sides of coop ten inches from bottom, so that I can take the rack out to clean it. In front of this rack and hinged to it I place a slat gate which drops down from rack to floor, forming a gate to keep the chicks from running under the roosting rack and also forming a ladder for the chicks to run up and down on.

I put these brood coops around in different parts of the yard under trees, placed so that the morning sun will strike

one end of coop and so that it will be in the shade through the middle of the day. In front of these coops I place a small yard in which I shut the chicks for the first two or three days, till they get used to their new quarters, then I open the yards and let them have full range, always feeding and watering in or near the coops. In this way of brooding I have had the greatest success raising chicks.

My experience has taught me that it is almost impossible to raise chicks that are not properly incubated, when the weather gets real warm I find it necessary to cool the eggs for a long time. I leave them out of the incubator and leave the door open from an hour to an hour and a half till they are thoroughly cooled, and then the chicks will hatch out strong and quick and are easily raised.

I find it best not to put more than fifty chicks in one brood coop, as they will do much better than though there

were more in one coop. Fifty chicks in a coop the size that I have described will do well and grow one-third faster than one hundred in the same coop; even if you make the coop twice the size, the fifty will do far better than one hundred or more in one lot.

My method of feeding young chicks is as follows: For the first five days I give them nothing but steel cut oats and dry wheat bran, keeping grit and fresh water before them at all times. For the next five days I feed much the same with a little variety added, such as cornbread made out of corn meal and wheat bran. I also feed a little cracked wheat. After they are ten days or two weeks old I begin to feed cracked corn, whole wheat, a little millet and sugar cane seed, green cut bone twice a week and later on a few sunflower seeds. Chicks are like Yankees, they like a variety.

WILLIAM WEBB.

HATCHING AND RAISING THE CHICKS.

A Discussion of Simple, Practical Methods of Hatching, Brooding, Growing, Fattening and Maturing Chicks, Wherein Exercise and Pure Air Play Prominent Parts.

By H. A. Nourse.

MAN has invented and built machines to supplant the hen in the motherly functions of hatching and raising, but the old hen still has a monopoly of the egg producing branch of the business. Still she can supply such eggs as hatch strong, vigorous chicks only when she is well taken care of.

The matter of conditioning the breeding stock is not a difficult or intricate proposition. If the birds are kept in good flesh, not fat, and have plenty of good food, fresh air and exercise, there will be no trouble getting fertile eggs that will hatch. Eggs with weak germs will sometimes hatch well, but the chicks will not be worth the trouble.

Eggs intended for hatching should not be chilled, but in cold weather should be collected very frequently and placed in a dry room where the temperature is about stationary at 45 degrees. Although it is desirable to set all eggs as soon as possible after they are collected, they may be held for two weeks without much deterioration if the above conditions prevail. Cases are recorded where eggs have been kept four and even six weeks, and have hatched. Only such eggs should be selected for incubation as are of medium size and good shape, with perfect or nearly perfect shells. Small or extra large eggs seldom give good results and porous shells allow too rapid evaporation or too rapid absorption, as the condition of the surrounding air varies.

From Shell to Brooder.

It is not difficult to secure good hatches from good eggs; almost any one having a good machine can obtain a satisfactory hatch. Authorities differ somewhat as to the benefits derived from cooling the eggs and a few deny that any good can come of the practice; but the consensus of opinion seems to be that reasonable cooling is decidedly beneficial. In cold weather the best hatches seem to be secured from eggs which are cooled slightly the twelfth day and for an increasing period each day until the eighteenth, inclusive, when they are allowed to remain out of the machine until the shells feel but slightly warm to the touch; but in warm weather they are cooled a few minutes on the fifth and the time increased daily up to the eighteenth day, after which they should not be touched again. On this day they remain

out fifteen or twenty minutes and sometimes, on a very warm day, for a half hour. Cooling should be done when turning the eggs at evening. Do not disturb the trays from this time until the hatch is complete. When all the chicks appear to be pretty well dried, open the machine, remove the trays and closing the door, except a minute crack for better ventilation, leave the little fellows in the egg chamber for twenty-four to forty-eight hours, gradually decreasing the temperature until the thermometer registers ninety-five at the end of twenty-four hours. As the thermometer hangs above the chicks, it is probably a degree less at the chicks' heads. I have found this plan to work very satisfactorily. The chicks go into the brooder accustomed to a lower temperature and ready to eat anything that they can find. I believe that most machines do not furnish enough fresh air for the little chicks after they are well dried off and open the door just a little that they may be supplied.

The temperature of the brooder should be fixed at ninety before the chicks are put in, as its complement of chicks adds two to five degrees when they are under the hover.

Feeding the Little Chicks.

So many different methods of feeding brooder chicks are advised by people whose experience and success entitle them to consideration, that what one man says should be taken merely as an opinion until one tries it and finds it satisfactory for his own use. For years I believed that nothing could equal the time honored corn meal cake baked hard and fed dry to the baby chicks. I doubt if anything can beat it much to-day, but the prepared chick feeds, now on the market, offer a well balanced ration of dry grains with the proper allowance of beef scrap, grit, charcoal, etc., in a convenient form and at a reasonable price.

I believe that chicks often get too much food when they are first placed in the brooder and that heavy losses frequently occur from that cause alone. The best results have been obtained when the chicks were left in the incubator for a day and a half without food after the hatch has been completed, and when placed in the brooder fed one light feed the first day, two the second and three the third. Beginning on the fourth day five feeds may be fed daily; but they

should be very light and never more than enough to satisfy the chicks for the time.

Exercise Necessary for Health.

Every inducement should be offered the youngsters to scratch and dig and the exercising apartment in the brooder and the adjacent pen in the house should be thickly carpeted with some good scratching material to that end. Hay chaff is one of the best things for this purpose and can be easily obtained. Any one who stores or feeds hay has more or less of it and is usually glad to get rid of it. It contains many small seeds and bits of clover, which the little fellows make good use of and for which they will search diligently if healthy and not too well supplied by the attendant. The temperature of the brooder house should not be too high. Some will deny that it is well to heat the house at all, and many, either from preference or lack of equipment, supply no heat to the house except that which escapes from the brooders. When the chicks are small, however, I believe

chick, and the science of feeding will be wonderfully simplified.

Pure, fresh water should be always accessible if a dry grain ration is fed. Opinions differ as to the advisability of supplying water when feeding a mash ration and some poultrymen seem to have greater success when giving water and others when withholding it. The writer's opinion is that no water need be given for the first two or three weeks when feeding a moist mash, and that chicks will do well without it.

From the Fourth to the Eighth Week.

Whatever method of feeding is employed for the first three or four weeks, the scheme to be followed for a few succeeding weeks may be the same.

The degree of heat will have been gradually reduced to eighty at the end of four weeks and may be further reduced to seventy at the end of six weeks, where it may remain so long as the chicks need a hover. No more heat is needed in



Interior View of Brooder House, with Pipe System, Hovers on White Leghorn Poultry Yards.

that a moderate degree of heat, about sixty degrees, is desirable in cold weather in that it enables the chicks to spend more time on the floor of the pen getting up their muscle. It should be remembered that sixty degrees recorded when the thermometer is three feet above the floor is not sixty degrees down where the chicks are. Place the thermometer within a few inches of the floor.

The best manner of feeding is the one that will best promote exercise. If dry food in the form of grain is given it is best, especially in cold weather, when the little birds cannot get outdoors to exercise, to mix this in the litter and compel them to scratch it out.

Pure Air of First Importance.

In rearing chicks pure air is a very important factor that seldom gets due recognition. Cheap as it is, and necessary for the vital processes concerned in maintaining and developing all forms of energy, it is not unusual to find brooder houses with no provision for any where near an adequate supply. Brooder stoves and heaters are burning out what little oxygen there is while owners and managers are wildly endeavoring to figure out some intricately balanced ration to reduce the frightful mortality. Provide plenty of good air under the hovers and wherever else there is a

the house than is necessary to remove the chill in the air in cold weather.

A gradual change from the baby food of the first four weeks to the more substantial diet of mash, cracked corn and wheat should be accomplished in ten days or two weeks. This is a period of growth; and the chicks should have all the food they can make use of. More fresh air, exercise, and as much outside run as possible are potent factors in their development. Green food must be furnished. If in spring and the grass has started, fresh short grass cut in the fields when the dew is on, is the best to be had, next to that obtained by free range. But if nothing green is growing a supply of cabbage, mangel wurzels, and clover meal for the mash (one or all three) is the best that can be offered and is of substantial value.

I have had success feeding a simple mash of two-thirds wheat bran, one-third corn meal, with ten per cent of beef scraps added, fed three times a day—morning, noon and night, with an allowance of wheat at mid-forenoon and of cracked corn at mid-afternoon. Grit and charcoal should be kept in the pen, preferably in a hopper where it will be clean.

No more food should be given at any time than will be consumed at once and if any mash is left it should be taken

up when the attendant takes up and cleans the troughs or boards, as he ought to do after each meal.

It is understood, of course, that the grain is fed in litter on the floor of the pen and of sufficient quantity to induce vigorous scratching, but no more.

After the Eighth Week.

From the eighth week forward different treatment must be accorded those intended for stock purposes or large roasters and those intended for broilers; only the broilers-to-be should remain longer in the brooder house. The others should be placed out in the field in roosting coops if the weather is warm or housed in warm (not necessarily heated) quarters if the weather is still severe. Occasionally broiler chicks may advantageously be placed outside, especially if errors or carelessness in feeding have noticeably reduced their vitality or if, in the latter part of the season, it is impossible to maintain a temperate heat in the brooder house. Usually it is best to keep them in the house where they will take but a moderate exercise and will lay on flesh and fat without the toughening of the muscles which takes place when they have free range in the fields.

From the eighth week to killing time plenty of green food should be supplied every morning; the grain should be fed as before and the mash materially strengthened. Three parts corn meal, one part wheat bran and one part first quality beef scraps makes a simple and effective fattening food, which if fed to chicks in good health, supplemented by green stuff, fresh water, grit and charcoal, as directed, will make a full fleshed, fat broiler of unbeaten quality. One of the most important points to remember is that no mash nor troughs must be allowed in the pens except during the few minutes when the chicks are eating. No other than freshly

mixed mash should be fed, and any that remains when the troughs are removed should be taken away and may be fed to old birds.

A potent cause of trouble is overheating in the hovers. When the older chicks, from eight weeks forward, are allowed hovers they will frequently crowd into them at evening, cause a high temperature and lose in the night all the flesh they have gained in the day time. If they have access to hovers sufficient ventilation must be provided to keep down the heat. Always look through the brooders before retiring and arrange for the comfort of the occupants during the night. Much can be done to that end after the chicks have settled down.

For chicks intended for roasters no change in composition of the ration need be made except that a larger proportion of hard grain and less of mash should be fed and the number of meals reduced to three per day. Mash may be fed at morning and noon or only in the morning as best suits the judgment and convenience of the feeder, the remaining feeds being of grain, principally corn, wheat and oats.

When it becomes necessary to fatten roasting chickens, they may be confined in yards of moderate area and fed the same as advised for fattening broilers. Occasionally it may be advisable to place some of the quarrelsome males in a room which may be darkened except when they are eating.

The hatching and raising of chickens, while requiring constant and painstaking attention, is by no means a difficult proposition or one beyond the ability of the man or woman of average intelligence, and the application of common sense will produce satisfactory and profitable results.

H. A. NOURSE.

REARING BROODER CHICKS IN FLORIDA.

Good Foods, Good Brooders and Love for the Work Produce the Same Results in the South as in the North,

By H. Friedlander.

I SHALL not attempt to give the readers of this book points on a subject on which so much has been written, and by so able and experienced writers, but I simply wish to give an account of my success in raising chickens by artificial means. I used to raise chickens in Ohio for pleasure. Fifteen years ago I lost my health and was given up by physicians as a hopeless case of consumption. But I came to Florida, and among the pines I regained my health, and to-day I feel much better than I did fifteen or twenty years ago. Two years ago after losing my orange trees by freezes I took a notion to raise a few chickens. I started with a pen of ten hens and one cock from Ohio. That spring I raised two hundred chickens and sold twenty sittings of eggs, but I found it was such a trouble to raise them by hens that I bought a small incubator the following fall. I did not, however, depend on the incubator to hatch all my early chickens, but had some of my neighbors hatch some, and as soon as they were hatched and delivered to me, I put them in the brooders.

Of course the climate here and in Illinois is quite different, and what I did here will not do there. I kept the brooder outdoors, and at a temperature of 80 degrees. When

the sun was warm enough I let the chickens out in the sand, making a square yard about a foot high around the brooder. I think between incubator and brooder the latter is as important as the incubator. But whatever you do in the poultry business, incubator or brooder, you must have your whole mind on it, and love it. Many times I got up in the night to see if everything were all right, and often it was not.

I feed the first day toasted and ground up bread; a few days later fine cracked corn, then some wheat. Sometimes I make bread out of cracked corn and sour milk. Occasionally I give them dog meat, that is, not the meat of a dog, but meat that only dogs will eat, of which we have plenty in Florida. This meat I grind up with a meat grinder. I feed as often as possible—six times a day at first. Every time I look at the chicks I give them something. I had chickens nine weeks old weighing one and one-half pounds and when I left Florida for the north (May 1) I had three hundred chicks and had not lost a single one. By May 1st I had sold 2,100 eggs for hatching and 1,000 more during the summer, and all out of forty-five pullets. This year I have seventy hens and pullets, and expect to raise at least 500 chicks on a lot 100x400 feet.

H. FRIEDLANDER.

BROODER CHICKS, THEIR FEED AND CARE.

One Who Has Raised Flocks of Incubator Hatched Chicks Without Loss Tells How to Feed and Care for Them—Bowel Trouble a Result of Careless Feeding—Regularity in Feeding Desirable.

By Mrs. Bert H. White.

WHERE can one make a beginning in this never ending, inexhaustible subject? I consider the feeding of little chicks the most important part of poultry raising. The welfare not only of the chicks themselves, but of future generations of chicks depends upon how we feed and care for the young. "The hand that rocks the cradle is the hand that moves the world" holds good in poultry as well as with humans, and the hand that has fed the little chicks and fed them right this year, is the hand that will move the poultry interest in the coming years.

I raised two hatches last year, one of seventy-nine, the other of sixty-three chicks, and did not lose a single one. This fact has given me the presumption to venture to let others know how I did it. We hatch our chicks with incubators and hens—when the hens will sit. I am a great friend of the incubator, and while I have just as much respect now for the old biddies as I ever had, I have less confidence in them. I feed the incubator hatched chicks just the same as I do the chicks hatched by the hen-mother. I do not think there is quite as much danger from over-feeding the chicks with the hen, as they are less liable to lack the proper exercise. After the hatch is over I remove the chicks to the nursery brooder, which is heated and prepared for them, and feed. We read so much in the various poultry journals about not feeding chicks until they are twenty-four to thirty-six hours old. I do not believe you could make a chick eat before it is ready to eat, and that is when it is strong enough.

The first food consists of hard-boiled eggs, cracker or bread crumbs, and grit, made very fine. This is in proportion of two parts of the crumbs to one of egg, and a little grit mixed in. There are several kinds of grit for little chicks, but I prefer the shell grit and roll it fine myself. If this food is prepared right it will be a crumbly dry mixture. That is always the first food, and I remove all they do not eat. This, with a little pin-head oatmeal and rolled oats, and a little millet seed sprinkled in the litter in the bottom of the brooder, is the first three or four days' bill of fare. I give water on the second day and after that sweet milk once a day. On the fifth day I add baked corn bread to this bill of fare. And this is how I make it—two parts coarse cornmeal, one part prepared poultry food, one part bran (counting quarts as parts), a small handful of salt, and a tablespoonful of soda. I prefer to bake it in one large pan rather than several small ones, as there is not so much crust. Bake it until it is thoroughly done, and if it is just right it will be dry and crumble fine and not stick to the hand. This I always keep on hand, and it is one of the principal meals of the day until the chicks are old enough to eat wheat and cracked corn. I always mix a little grit in one of the feeds of the day.

After the chicks are two weeks old I feed some coarse cornmeal moistened with sweet milk, and it can be made just moist enough so that it will be mealy. I know it is right when I take a handful and squeeze it and no moisture sticks to the hand. If it is mealy and not sloppy there will be no

danger from bowel trouble. Feed this sparingly at first, as well as any other change in food. I always feed five times a day until after the third week, and then only three times a day. Great care must be exercised in order not to over-feed. I believe a great many chicks die from over-feeding, and those that do survive over-feeding are stunted. I think one must always govern the amount of food by the number of chicks in a brood, and no particular amount can be specified for each meal. All conditions being equal, just what they will clean up each time, and no more, is about the proper amount.

I begin to feed a little wheat and cracked corn at the end of the third week, and when the chicks are four or five weeks old I feed wheat in the morning and cracked corn at night, with oats for variety. I think oats is a splendid food for growing chicks, but I never have dared to feed it without first boiling it. It takes some time to teach them to like oats, but after a time they will relish it as much as they do wheat and corn. I think that chickens of all ages are fed too much corn. Wheat and oats are the best grains for chicks. I like to feed a little millet seed wherever the chicks are in the habit of scratching. It makes a nice little lunch for them at noon—just a few handfuls sprinkled around the brooders, so that they will find it when they come back for a drink and a rest at noon. Once or twice a week I boil the wheat for their breakfast. I boil it the evening before and let it stay on the stove until morning and it is just warm enough to feed. I do not pretend to say that all this is strictly necessary for the successful raising of chicks, but I have tried it and have had good results.

Variety in feeding forms an important item. I never mix the grains for variety's sake. Try feeding the same kind of grain every night for four or five nights without any change, and the chicks will not seem to care whether they eat or not. They seem to say to me—"That old stuff again!" It may be partly imagination, but I believe that variety is necessary to keep their appetites in good condition. I always keep a box of oyster shell and grit near each brooder.

Hatch your chicks early, "the quicker the sooner," as David Harum would say. Spring is the only nesting time for wild birds and it is the only good time for domestic breeds. If by any mischance or continued spell of damp weather, any bowel trouble may result, the feeding of boiled rice or scalded sweet milk will very soon adjust that trouble. I never feed any condition powder, pepper or any of the poultry cures advertised, but I use plenty of prevention, and never need any cures. Regularity in feeding is a very important matter in successful poultry culture. Have a regular time for each meal and do not vary from it. The first meal should be at daylight, and the last as late as possible before the chicks go to roost. Chicks are early risers and should be let out of the brooder as soon as it is daylight. I always build an enclosure around each brooder, and do not let them out of the brooder, and do not let them out of this enclosure until after the dew is dried off, or on cold windy mornings I can keep them there and put them back in the brooder to keep them from getting chilled. It is a

great mistake to allow too many chicks to run together in a brood. Scatter them and have brooders enough so that not over forty chicks are brooding together in the same brooder. I think thirty about the right number. Familiarity breeds worse than contempt with chickens, it breeds lice and disease.

The care of the brooder is very important. I exercise great care in keeping the nursery and brooders clean. How the chicks do enjoy clean quarters, and how they always begin scratching and working, with their little song of "weeting" all the while. If that does not repay you, you have not that love for the work that is necessary for successful poultry culture. The first week I clean the brooder twice, and after that usually give it some attention every day. I put dry sand in the bottom of the nursery and brooders and cover that with chaff or cut straw, and by taking off the top each day the sand need be renewed but once a week. I like the sand in the bottom of the brooders better than chaff alone, as the chicks do not slip in it. I have had chicks lame themselves by slipping on the smooth floor of the brooder.

I keep the temperature very near 90 degrees for the first three weeks. After that govern the temperature by the number of chicks in the brooder and the outside temperature. Trim the lamp every evening and fill it so as to insure an even blaze all night. Sometimes it is not necessary to keep the lamp lit all day in the outdoor brooder. On warm, sunny days the lamp can be put out and lit towards evening. If the brooders are not new or have been used before keep an eye open for lice, for like the poor they are always with us, and it is almost impossible to keep the brooder chicks from visiting with biddy's chicks.

After my chicks are six weeks old I remove them from the brooder and put them in a box to sleep. I get a large dry goods box, and put a tarred paper cover on what is to be the top. This prevents dampness, which is the greatest foe of little chicks. Nail a board on the top and bottom of the open side, or what is to be the front, and put on lath close enough so that the chicks cannot get through. At one end make a gate or door, whichever you wish to call it, out of lath and hang it with a piece of old leather or heavy cloth for hinges, with a hook to fasten it. (I use screen door hooks.) Put in sand and litter, and you have a good, substantial brooder coop that will last for years. I face these boxes to the south, and if there is a south wind I put old pieces of carpet over the opening for the first few nights. My chicks sleep in these coops until they are old enough to go to roost. Sometimes they grow so they fill the original box too full, and then I have to either give them a larger box or set another right beside the first one. These box coops are moved frequently, and each one is as



Subjects of Experiment at Rhode Island Experiment Station.

far from the other as it is convenient to have them. They soon learn which is their very own place to roost, and I am always sure I will find each brood in its place. Of course it is work, but not trouble, and in bad weather I forget all about the work, in the satisfaction of knowing that my chicks are tucked in cozy and dry at night.

Keep the drinking fountains clean. Scald them at least twice a week. If you are a close observer you know how foul they become without any one telling you. When it can be had I give all my young chickens sweet milk to drink once a day until matured. I always wash the fountain out after it has had milk in it, before putting water in it, and when the weather is warm enough to sour the milk that is left in the fountain, warm water is used to wash it out. I would just as soon eat my dinner off the same plate that I did my breakfast, without washing it, as to put water in a drinking fountain that had had milk in, without first washing it. I do not think it a good plan to let chicks drink in the morning before they have had their morning meal. I have had the best results by giving milk for their morning drink after they have had their morning meal. When it is cold I think it is best to warm the milk, and in a continued, damp spell, sometimes scald the milk.

I believe in little things, and it is the little things that count with little chicks. A little draught, a little too much food, a little neglect, cause all sorts of big evils and play havoc with the chicks. I do not believe there is a particle of excuse in poultry fanciers allowing so many chicks to die. In nearly every hatch there are one or two runts, and they will make up their minds to live or die in a few days, but after that if I lose a chick I feel that I have been slack or careless in some way. I believe that every year the true fanciers are raising a greater per cent of chicks hatched than they did a few years ago. Of course there are people who start in the poultry business not knowing or trying to learn anything about the habits and nature of chickens. They fail to raise even ten per cent of the chicks they hatch, but they seldom stay in the business long enough to either help or hinder it. But the true fancier of the stick-to-it type every year will raise "better poultry and more of it."

The care of chicks does not end until they reach the breeding pen. All through the long hot months of July and August they must be under our watchful care. This is the time that is most trying to the beginner, and this is the time that they usually make up their minds to stay or withdraw. Plenty of fresh water constantly before them is very essential for growing chicks. I always want my chicks to have full crops at night, but I want them to be hungry enough through the day to be willing to look out for their dinner themselves. Twice a day is often enough to feed the early hatched chicks through the months of summer. As the cool days and nights come on in the fall, they will let you know when they need an increase of rations. Let the chicks grow lanky and leggy, you can soon put the weight on them when cool weather comes. Care for the little chicks, remember it is always the prize winners that die—that is the reason why we get so few.

MRS. BERT WHITE.



Just Let Out for Morning Exercise.

SUCCESS WITH BROODER CHICKS.

Poultrymen Agree that the Strength of the Germ in the Egg is of First Importance—With Well Hatched Chicks, the Problem is More than Half Solved—Raw Eggs Advised for Small Brooder Chicks.

By J. W. Hodson.

WHEN one begins to think of raising young chickens, the first and most important thing that needs attention is the fertility of the eggs. If you have good, strong, fertile eggs the battle is half won. To be sure, judgment must be used in the operating of the incubators and brooders. The nearer we run the machines to nature the better the results; but if the eggs are poorly fertilized, the germ being weak, the best incubator that is made, operated by the foremost expert in the land, cannot get out a good hatch, and there are nine chances out of ten that the chicks that do get out of the shell will die before they are two weeks old, and those that do not die will never grow as they should. But if the eggs have the life and kick in them you need not worry. If you give the little peepers half a chance they will soon show you that they came into the world to stay.

It is in the winter when the courage of the poultryman is tested most severely. Sometimes we have filled our incubators with eggs in January and February and at the end of twenty-one days wished we had sold the eggs at the store. Sometimes at the end of the fifth day, when we made our first test, our hopes were high and we were telling our brother poultrymen what good hatches we were going to have, for we had taken only eight or ten infertile eggs out of a hundred; but by the time the fourteenth day came our assurance began to wane, and at the end of the twenty-first day we have found that nearly all the little chicks had died in the shell, getting perhaps twelve or fifteen out of eighty-five or ninety fertile eggs.

We could not blame the incubator, for it had been tested before. The trouble was with the eggs, and the lack of a strong life germ in them was due to some fault either in the hen or male bird, and their inability to produce well fertilized eggs was probably due to some fault of our own—either they were not properly housed or fed, or may be both. The houses may have been too cold or the chickens too fat. In either case you will not get many strongly fertile eggs.

We keep our incubators in a cellar where the tempera-

ture is about the same all the time. Outside changes make little difference in the temperature around the incubators, therefore when we once get our machines regulated we have little trouble with them, and when we go to bed we sleep and get up in the morning to find the thermometers within one degree of where we left them the evening before.

Care of the Little Chicks.

As soon as the little chicks are thoroughly dried we take them out of the incubators and do not allow them to remain in the temperature of 103 or 104. As long as they are damp we believe they are better off in the incubator, but no longer. We have a brooder ready to receive them that is heated to about 100 around the hover, 85 or 90 about one foot from the hover. We let them remain in the brooders thirty-six to forty-eight hours before we give them anything to eat or drink. They will show signs when hungry. We keep the bottom of the brooder covered with clover chaff or cut clover, and when the little ones get hungry you will see them picking and hunting for something to eat.

Our first feed consists of a mixture of cracked corn and wheat that has been put in the oven and parched, or roasted as they do coffee, only it is not quite so brown. To this we add a little rolled oats, grit and oyster shells. This mixture is sprinkled in the litter and they must work for what they get.

When about one week old we feed once a day a soft mash, consisting of one part wheat bran, one part middlings, one part corn and oats ground together (with the oat hulls sifted out), and about five per cent of beef meal. Mix this well together and take enough raw eggs to make it stiff and crumbly. We use incubator eggs that have been tested out on the fifth day. We think this is one of the finest foods we can get and the way our chicks grow satisfies us that they have about what they need. After the chicks are one week old we feed only three times a day; when less than a week old, four times. We want to see the chicks hungry.

J. W. HODSON.



Colony Houses and Some of the Plano Box Brooders on Beaver Hill Farm, Described by Charles P. Glogger.

BROODING AND FEEDING CHICKS.

A Large Brooder Which Can be Converted into a Roosting Coop—Plenty of Room Essential for Growth—The Correct Degree of Heat—The Food and Manner of Feeding.

By Charles P. Glogger.

ALTHOUGH my experience with brooders is not particularly extensive, I have learned something about the rearing of chicks artificially that will benefit the amateur at least. A good brooder is essential. If one intends doing much of any work with brooders, they should be five and one-half feet square, or large enough to hold comfortably fifty chicks until twelve weeks old. No matter how large or how small the brooder is, never place more than three or four chicks to every square foot of floor space; overcrowding must be avoided. The best success I have had with young chicks has been with our piano box colony brooders. They are closely and neatly covered with heavy paper, are five and one-half feet square, five feet high in front, three feet high at the back and have a solid shed roof, with a door at the side and a window in front. We set



A Flock of Promising White Leghorn Chicks.

them twelve inches off the ground, so that the lamp box underneath can be reached conveniently. The heating arrangement is very simple; we cut a hole in the floor fourteen inches square six inches from the rear wall, making the center of this hole midway between the ends. Into this we fit closely the ordinary square tin radiator, the bottom coming flush with the floor of the brooder and resting on projecting cleats, with the fume pipe projecting through the roof of the brooder. We use a No. 3 lamp burner, which gives enough heat in cold weather. Over the radiator with a half inch air space we place a board hover twenty-six inches square so that it projects six inches beyond the radiator on all sides. From it are suspended the usual cotton flannel curtains. The thermometer is attached to a round stick twelve inches long which projects through a round hole at the back of the brooder and which reaches past the middle of one end of the hover. One great advantage of this brooder is that when your chicks no longer need arti-

cial heat you can in five minutes convert it into a colony house by simply lifting out the radiator and nailing a board fourteen inches square in its place. Put in perches and thirty chicks can perch there until ready for the breeding pens.

From my individual experience in raising chicks with brooders I find my greatest success is secured when I have less, rather than more, than fifty chicks together. When I do not exceed this number I have no cases of bowel trouble if my chicks are healthy when placed in the brooder.

Warmth and Food.

I start my chicks in the brooders at ninety degrees of heat and the warmth of fifty chicks will soon increase it to one hundred. This temperature, however, should not be maintained more than a week, when it should be gradually reduced to eighty by the time the chicks are three weeks old. This is my plan in the winter or early spring, but later in the season I do not get over eighty-five degrees to start with and gradually reduce to seventy degrees. My experience has been that chicks coddled too much are never strong. For the first week I keep them as near the hover as possible. One cannot be too careful, and a board placed six inches from the hover will keep the little fellows within bounds and they will not become chilled. Should they feel the cold they can easily get back under the hover again and warm up.

As to the manner of feeding, I may not conform to the generally accepted order of things. In the first place I am no believer in soft food for young chicks, but am fully convinced that it produces more bowel trouble than any other one thing, not excepting crowding. Therefore it is very seldom my young chicks get mash. Forty-eight hours after hatching I sprinkle a few dry bread crumbs on the brooder floor with a little fine grit. I keep milk or water before them all the time, and the second day feed them three times a few broken crackers. The third day I start with my chick feed and I find the little fellows can pick out the small particles in great shape, and how they do grow! In feeding dry food, composed mostly of grain, with the necessary quantity of meats and bone, I believe we imitate nature closer than by feeding a mash.

I believe in exercise and see more real benefit in the heat produced in the body by scratching than that which is given artificially. Clover cut in about one-fourth inch lengths is light material and if cracked grain or millet is scattered in this litter, how the little fellows will work!

Another thing I never neglect is the use of bran to prevent bowel trouble. In each brooder I keep a small box of dry bran and charcoal and the quantity of bran these little fellows will eat and the good condition of the bran fed chicks is surprising. Our early chicks are fed plenty of cabbage or apples for green food.

CHARLES P. GLOGGER.

CARE OF BROODER CHICKS.

If Labor is an Item of Expense, then a Successful Way of Raising Chicks With One-third the Usual Labor Deserves a Fair Trial.

By W. H. Bushell.

60 **H**OW shall we best care for the brooder chicks?" We leave the chickens in the incubator twelve hours after all the chickens are hatched, which gives them strength; then we remove them to the brooder that is heated up to ninety degrees under the hover and seventy degrees outside the hover. We leave the chicks alone in the brooder twenty-four hours before feeding or watering them. The floor of the brooder is covered with sand and cut clover, the clover being used to prevent the chicks from slipping.

When the youngest chick is thirty-six hours old, we feed and water them for the first time, some of the little ones being forty-eight to sixty hours old. We give them prepared chick feed and clean water in a fountain that is made so that the chick can drink, but cannot get into the water or soil it.

The chick food consists of all kinds of seeds that grow in the fields, with some grit and beef scraps. We feed three times a day and only what the chicks will eat up clean. We feed it in the cut clover so as to force the chicks to exercise. We do not have any bowel trouble nor sickly chicks; nor do we have to run out and feed them every two hours; nor do we keep the cook busy baking johnny cake and all kinds of foolish things and washing dishes; nor do we give milk to drink—it is too mussy. We simply feed the chick feed and give clean water three times a day. The work is

cut down and we raise the chickens. It is seldom that we find a dead chick in the brooder.

We are often asked by visiting poultry people if the chick feed is not expensive. I always reply that it is the cheapest food you can get, because it saves two-thirds of the labor and you can raise the chicks successfully on it. Besides, it is of great help in keeping the brooders clean. I know we had less trouble to raise nine hundred chicks last year than some people did who raised only one hundred.

We use the hot-water, over-head pipe, continuous brooder system and we keep from thirty to forty chicks in one pen, changing them every week to a fresh compartment. The pens are all built alike, except that some of the pipes are higher to allow for the growth of the chicks and so that the hover will be cooler. By having each pen alike the chicks do not mind the change. They know where to find their hover and they do not "pile up."

My house is twelve feet wide, seventy feet long, and is piped the entire length. The pens are three feet wide by nine feet long, which leaves an alley-way three feet wide in which to work. We have been very successful in raising chicks in this house and are well pleased with it.

I use a little air-slaked lime on the floor and dust the hover of my brooder once a week. We clean the brooder under the hover every morning and change the straw in the pen every fifth day. I have never had a louse in my brooder house.

W. H. BUSHELL.



A Substantial Brooding House That is Well Shaded in Summer—A Building for Storage, etc. (Attached) is Shown at the Right.

HATCHING AND REARING CHICKS WITH HENS.

The Location for Nests and Protection from Lice and Weather—Care of Hens and Newly Hatched Chicks—Cooping and Feeding the Brood.

By H. A. Nourse.

THE process of hatching and raising chicks by natural means is simple and easy on the face of it; the hen does the work and in proof of her ability we cite a case wherein the hen steals away and in due time returns with a big brood of chicks which she raises with little or no loss. Granting that this may be the uniform result, we must give some credit to the conditions and not all to the hen. This satisfactory result does not often occur when the weather is cold, but rather when it is warm, and the hen selects a nesting place with natural advantages. The nest is surrounded by the pure air of nature, and the hen can leave it without danger of the eggs becoming chilled. She dusts herself thoroughly and often in the damp earth and thus keeps her plumage clean and comparatively free from lice.

When the hatch is completed the chicks are not immediately stuffed with food, but exercised gently and brooded frequently while gathering from the pure air oxygen for a myriad of strength giving blood corpuscles, until the nourishment with which nature provides all well hatched chicks is assimilated and stronger food may be digested and made most of by a system ready for the work.

But if we want early chicks we must set hens in the cold and changeable weather of early spring. Sometimes we set them in a place poorly protected from the weather and often the hens are neither allowed a dust bath nor given any protection whatever from the irritating pests—lice.

A setting hen deserves about as much protection from cold or heat as an incubator, but seldom gets it. In cold weather a well built warm room is a great advantage and in warm weather, which frequently overtakes the poultryman before he has finished hatching, well ventilated and moderately cool quarters will be of considerable assistance.

Setting the Hen.

The nest should be carefully built of fine, soft hay and of such size and shape that the hen will fit nicely into it, affording perfect protection to the eggs. It should be reasonably flat on the bottom at hatching time or the chicks attempting to leave the shell at the bottom of the nest will often be crushed by the unhatched eggs rolling down from the sloping sides.

Every means should be used to secure the absence of lice. Nothing is so likely to bring about a poor hatch of good eggs or to prevent the successful rearing of the chicks as lice. A dust bath for the sitters to dust in should be provided if practicable and each bird should be thoroughly dusted with insect powder at least once a week, the last dusting to be done three days before the hatch is due.

If a pedigree record of the fowls is kept the nest should be marked with the number representing the parentage of the chicks and each chick punched as it is taken from the nest, thereby avoiding all chance of mistake and making the mark when it will hurt the chick least and be least likely to fill up.

There is danger of empty shells capping unhatched eggs and imprisoning the chicks and it should be prevented by reaching under the hen and removing the shells at frequent intervals during the exclusion of the chicks.

Nothing is gained by hurrying the chicks from the nest; if the hen desires to leave the nest as soon as the hatch is finished (or even while it is in progress) the nest may be covered with a light cloth (if the weather is cold) and the hen allowed to stretch, eat and drink, after which she will again seek the brood and quickly make them warm and comfortable. It is well to give the hen a little food and water while on the nest if the chicks come out slowly, confining her to the nest for two or three days.

Caring for the Chicks.

After the chicks have been out of the shell twenty-four hours it is early enough to move them to their coop.



A Stolen Nest.

As each chick is taken from the nest, and the identification mark punched in the web of its foot, its head should be anointed with vaseline or lard sufficient to smooth the down closely about the skull to kill head lice. The hen should be well dusted and the action repeated once a week so long as she remains with the chicks.

If small coops are used it is an advantage to be able to put them under a shed with open front to the south where the chicks will be protected from inclement weather and winds while getting plenty of exercise upon the ground; the hen remaining confined to the coop.

I am much in favor of large coops, at least three feet square on the bottom, tightly built to keep out dampness, yet permitting sufficient ventilation to keep them cool in warm weather.

Care of the Brood.

The first day in the coop the hen should have a good ration of whole corn, but the chicks need only a very light

feed of crumbled stale bread, johnny cake, or prepared chick feed. I incline toward the prepared food, because it can be bought ready to feed at a reasonable price and gives excellent satisfaction.

The second day the little ones may have two light feeds and on the third day three. After that three, four or five feeds may be offered each day according to the time and inclination of the feeder, but no more should be given at any time than will be eaten within a few minutes. During the first few days the hen may be fed any large grain and the brood won't make much effort to eat it, but after a few days the young ones will try to eat any and everything that the hen does. Cracked corn and whole wheat may safely be fed with the chick feed, the latter being gradually eliminated after the second week and its place taken by the cracked corn and wheat, with an occasional feed of mash at the feeder's option. Clean water should be provided from the start and fine grit for the chicks and coarse grit for the hen should be given with the first feed and be always accessible.

A small proportion of animal food is desirable after the first week. Most of the prepared foods contain this in the proper proportion, but if it is supplied by the feeder, sifted

beef scraps to make five per cent of each day's rations will be found very satisfactory for the first two weeks or for four weeks if the chicks have a chance to hunt insects and worms.

When the weather is warm and the birds are safe from birds and beasts of prey the hen may be given her freedom and permitted to run with the chicks after the first week. This is of great value to the chicks, giving them wider range and providing all sorts of little seeds, bugs, worms and insects, which nature intended they should have. It makes the chicks self-reliant, too, and better able to take care of themselves, while making the most of their opportunities, when the hen leaves them to shift for themselves.

A cropful of food collected by the chick from nature's resources is worth two of that fed by an attendant and consumed by a chick confined within a narrow enclosure. It is gathered a little here and a bit there, some vegetable and some animal, by vigorous exercise taken under conditions which cannot fail to promote a healthy action of the digestive organs. Thus the nourishment is absorbed and the body strengthened and properly developed. Nature's methods are always best when the work is done in nature's season.

H. A. NOURSE.

THE NATURAL METHOD IS SATISFACTORY.

How an Expert Hatches and Rears Winners for the Largest Shows—Making the Nests—Sitting the Hens—Cooping and Feeding the Chicks.

By M. S. Gardner.

SO MANY writers of late have told us how to hatch chickens in incubators, and raise them in brooders, that little remains to be said upon that subject.

Very little has been written, however, in regard to the other and older method of letting the hen rear her own brood. While I use incubators for hatching my earlier chickens, I still hatch the greater part of the May and June chicks under hens, and for two reasons: First, because I believe it gives the hen a rest from laying that is beneficial to her, and second, because I find that chickens hatched and reared by hens prove better foragers and grow faster for me than those grown in brooders.

To successfully raise chickens with hens, several things are absolutely necessary. First, strongly fertilized eggs from perfectly healthy and vigorous breeding stock. Second, quiet, medium sized hens, and properly constructed nests. Third, a man to care for the hens who will exercise eternal vigilance, and who can control his temper under most trying circumstances. Doubtless every man who raises chickens has a way of his own. I do not claim that my way is the only one, or even that it is the best, but simply this, that I have been raising thoroughbred chickens for more than twenty-five years, and with success, by the method I shall describe. During the season of 1902 I raised more than five hundred chickens under hens. Although May and June were the wettest months ever known in this state, my loss from all causes did not exceed five per cent of the chickens hatched.

Setting the Hens.

As March is a cold month in northern New York, we do not attempt to set any hens until April. When the weather moderates so that we feel sure the eggs will not chill, we

prepare to set our first hens. Several pens are reserved for our sitters, from four to ten hens being placed in each pen, depending upon the size of pen and also upon how much room we can spare for this purpose. The nests are made on the floor of straw or swale hay which is held in place by two by fours placed upon the floor or else by narrow strips of board nailed to the floor and not more than four inches high. It is desirable that the hens be able to walk onto the nests, and not be compelled or allowed to fly into them. Sometimes if crowded for room these nests are not more than three feet apart. We usually set several hens at one time. When we have the required number of broody hens we take them carefully from their nests after dark at night and place them in their new quarters, having previously prepared the nests in the manner I have described. In each of these nests we have placed one or two glass eggs or possibly cheap hens' eggs. By the side of each nest is a potato crate or a frame covered with wire netting. Each hen is carefully set on the glass eggs and a potato crate placed over her. A hen that has been broody for several days and is of the proper disposition to make a good mother will at once settle down upon her new nest and go to sleep. Occasionally one will resent such treatment and proceed to kick up a rumpus. Such hens should be removed at once, as they disturb the quieter ones and seldom prove successful mothers. I do not find more than one in ten that will refuse to sit in a nest of this kind. The first day we keep the room darkened and do not let the hens come off to eat. The morning of the second day the crates are removed and sufficient light let in to enable the hens to see the corn, grit and water that have been previously placed there. A large dust box is also provided for them. Sometimes two hens will fight

when first let off the nests, if taken from different pens in the breeding houses, but this seldom proves a serious affair, as they are usually too hungry to waste any time in this manner. After eating and drinking four out of every five will go back to the nest in which we placed them. Some few will exchange nests, but it is very seldom a hen refuses to go back to one of the nests. As all of the eggs are in plain view from all parts of the pen, two hens seldom try to occupy the same nest.

In making the nests we use great care in preparing the bottom so that the eggs will not come in contact with the floor. We also make them rather flat and large enough in diameter so that the eggs can roll from under the hens' feet as they step into the nests. My reason for making the nests upon the floor is this: Under natural conditions all fowls no doubt built upon the ground, as partridges do. When a hen can walk onto her nest she does it very carefully and seldom breaks an egg. If compelled to fly or jump up she usually succeeds in falling into the nest and breaking one or more eggs. Another advantage in placing the nest upon the floor is that the eggs do not dry out as badly as when placed farther from the ground.

The Eggs Require Attention.

Now to return to the sitting hens. We have them fed and watered and back on their nests. If one fails to go back the room is darkened, the hen is carefully caught and placed upon her nest, and the potato crate dropped over her. If at this time all remain quiet the eggs for hatching are brought and placed under them. From ten to fifteen are given to a hen, the number depending upon the weather and the size of the hen. In very early spring not more than ten eggs are placed under each hen, as the outer ones may become chilled or at least get cold if more are used, then as the hen rolls them over the chilled eggs are pushed further under her and others are rolled to the outside to be spoiled during the next cold night. I am satisfied that many poor hatches in early spring are due to the fact that too many eggs are placed under the hens.

We now have our hens properly started on their three weeks' task and have only to watch them carefully and see that they have fresh water every day, with an abundant supply of grit and corn. A lousy hen never should be set. We keep a good supply of fine dry dirt for dust bath before our fowls at all times, so we have no trouble with lice. By the second day we usually remove the potato crates from over the hens and thereafter they are at liberty to come off to eat or roll in the dust bath as often as they desire. Every day when they are off each nest is inspected and if any eggs are broken the others are carefully washed, but we seldom have any trouble of this kind. I have no use for a ten pound hen as a sitter or anywhere else. For hatching purposes I prefer one weighing not more than six or seven pounds. Where it is possible to do so we set all the hens in one pen at the same time. Where some are put in later they usually disturb those that have been sitting, then when the first chicks began to hatch it makes those set later discontented. If the weather is very hot and dry and the eggs are drying down too much, we sprinkle the nests with warm water once or twice during the last two weeks.

When the chicks begin to hatch we disturb the hens as little as possible. Sometimes if they are very quiet I run my hand very carefully under them and remove all the empty shells so they will not slip over the unhatched eggs and smother the chickens.

Cooping and Feeding.

Nearly all our chicken coops are dry goods boxes covered with tar paper, to keep the rain out. These are boarded up tight about half way across the front, and slatted the rest of the distance, so the chickens can run out and in, but the hen cannot. Into these coops the hens and chickens are removed when the chickens are about twenty-four hours old, a little bran, chaff or dry sand having previously been sprinkled upon the floor. Not more than a dozen chickens are given to one hen and we often give them only seven or eight chicks each. The coops are scattered out through the corn-fields and in other protected places so that each breed has a fresh run and plenty of grass. When the chicks are placed in the coops they are fed dry oatmeal and hard boiled egg



A Fine Place for Growing Chicks on the Farm of Gardner and Dunning.

chopped up very fine. They are also given some fine grit and a cup of water, which is refilled as often as necessary and not allowed to sit in the sun where it will become warm. The second day they are fed on cooked food. Three parts cornmeal and one part "red dog" flour or wheat middlings are mixed with skim milk and a sufficient amount of baking soda to make it light. It is then baked until well done. This is softened with milk or water and fed five times a day for the first ten days. At the end of ten days if the weather is suitable the hen is let out of her coop and allowed to go where she pleases. After this they are fed but three times per day. At six weeks or before we begin to feed cracked corn and wheat. Occasionally a hen fails to return to her coop the first night and we must find her and drive her in, but usually they come back without trouble.

As each brood of chickens is placed in the coops they are punch marked and examined for head lice. If any are found their heads are greased with pure lard, which usually answers the purpose and a second application is seldom necessary. Each night every coop is shut up to keep out the rats and skunks which abound in northern New York. For this purpose a frame covered with a fine wire screen is used. This admits plenty of fresh air, which is absolutely essential to growing chickens.

Some of our hens take their broods fully a quarter of a mile from their coops every day, and in this way teach them to hustle for themselves. Nothing will develop a Barred Rock cockerel's muscle and make his bones grow like chasing grasshoppers through a cornfield. It answers the same purpose as foot-ball for a boy. When the hens begin to wean their chicks, great care must be exercised to prevent crowding in the coops at night, as several broods will often be found in one box. If they are not separated, crooked tails, twisted wings and small, stunted chicks will be the result. I believe crowding and overheating in the coop or brooder

to be the cause of more poor chickens, more crooked, deformed birds, more attacks of roup and other contagious diseases, than all other causes combined. We do not intend to allow more than ten or twelve chickens in one coop, no matter how large it may be, and as soon as possible teach them to roost, as they are less liable to crowd and pile up in a heap on the roost than in a coop. For this purpose we use a weaning coop, or colony house, set up from the ground, into which we move our growing chicks as soon as they evince a desire to fly upon the top of their small coops at night.

M. S. GARDNER.

HOW I MANAGE SITTING HENS.

A Well Known Breeder Tells How He Has Reduced to a Minimum the Work of Hatching with Hens.

By Dr. H. F. Ballard.

TO BEGIN with, breeders of Asiatics should have, or at least they like to have some early sitters. To have early sitters we must have early layers. To have early layers we must begin to feed for eggs early, say January 1. Then if you get a few hens to start the incubating fever in February you have done well. I aim to set every hen that goes to sitting early, and I do not wait for two hens to sit at a time so early in the season. I have an old shed barn in which I set all my hens, and they are never allowed outside of the barn from the day they are set until the chicks are three days old. Each hen has a nest box about eighteen inches square that can be closed in front. I generally get boxes at the grocery or drug store and nail on boards in front and use a barrel stave as a door, which can be slipped down in front when closed.

The first evening the hen is placed on two or three china eggs to test her persistence as a sitter and her character as to temper. If she settles down quietly the first thing she is A No. 1. If she stands and begins to poke her head out between the boards, she is A No. 2. But do not pay any more attention to her now, just go quietly away and let her think it over. The chances are she will be sitting quietly in the morning, but whether she is or not I do not let her off the nest, but place food and water before her where she can reach it, and do not disturb her otherwise. If she is

quiet the eggs can be given her the second evening, but if she is restless it is better to wait until the third evening before giving her the eggs. Some hens will do better after they get a nest full of eggs. They seem to know that the china eggs are a delusion and a snare.

If the hen persists in standing up and cackling and tramping over the nest regardless of the eggs, the quicker you break her up the better. For the last five years I have never seen a sitting hen that I could not break from sitting in three days, and I am breeding Cochins, a breed that are considered by many people as good for nothing but sitting. Those people simply do not know much about Cochins—that is all. I have bred Langshans, Brahmas and Plymouth Rocks, and the Cochins are no worse than any of them about sitting, while they make the best mothers of the whole list when they sit and hatch a brood.

In the same building where I set my hens, I keep all my extra cocks and cockerels. These are divided up into coops of one, two, or three or more, according to their fighting propensities. Into one of these coops our contrary sitting hen—that thought she wanted to sit and would not—goes instanter. If she is a white hen, of course she is put in with a white male bird; if a Partridge, with a Partridge, and so on. Inside of three or four days he has persuaded her to give it up as all a mistake, this sitting business anyhow, and you can then turn her into the regular pen again. So much for the breaking up, and it will work every time, whether your hen has been sitting three days or three weeks.

To return to the sitter, providing she sits all right, on the morning of the third day, when she has been on the nest about thirty-six hours, open the door of the coop so she can come off. Do not take her off, but let her come off in her own way. She will be much more apt to go back to the nest of her own accord, but if she does not, try to gently drive her back. If she won't go back, catch her and put her back and fasten her up again. If she goes back of her own free will you may leave her nest open, as by that time she is getting used to things and will perhaps need little further attention. Sometimes it requires two or three trials before she will go to her own nest, but she must be taught to do so, or fastened up each time until she learns it. In the house where my sitting hens are I always keep plenty of food, water, grit and ash heap to roll in.

After your hen has been sitting about eight days you



A Prize-winning Hen and Healthy Brood.

should test out all the infertile eggs. All the tester I use is a common lantern and my two hands. I set my lantern on top of the box in which the hen is, any time after dark, on the eighth day, or on up to the tenth day. I take each egg between the thumb and first finger of both hands and hold it up between my eyes and the light, so I can see through. If the egg is infertile it will be a clear yellow color all over. If there is a chick started in it the embryo can be seen. Testing in this way is the simplest thing imaginable. I leave the infertile eggs in a basket until morning, when they are broken into the ground feed and fed to the laying hens. If you have a pen of hens that have taken to eating their eggs feed them to them without breaking them. Feed them all they will eat and they will get foundered on eggs and soon let them alone.

Some writers advise setting two hens at once, and when you test out a part give what eggs are left to one hen, and set the other on fresh eggs. Do not do it. It makes the second hen have to sit too long and about the time she comes off with her chicks you may lose her. But let each hen keep her own eggs and if there are not more than eight or nine chicks when they both hatch, one hen can take all and the other, for her own good, must be broken up. Another thing that I do for my sitting hens is to sprinkle every hen once a week with some good insecticide. I make a mixture of crude carbolic acid one ounce, sulphur four pounds, and sifted coal ashes about eight or ten pounds. This dilutes the carbolic acid sufficiently, so it is not dangerous and can

be sprinkled over the backs of the hens on the nests, with the bare hand.

As I said in the beginning my sitting hens are among the least of my troubles, but if somebody can tell me how to



The Brooder of Our Forefathers.

keep my neighbors' dogs and cats and rats and weasles and minks from killing my birds, without my getting into a racket with my neighbors, such information will be thankfully received.

H. F. BALLARD, M. D.

HATCHING WITH STRANGE HENS.

Orange Boxes Made Very Good Double Nests—The Care of Sitting Hens that are Moved from One Farm to Another.

By C. A. Dutton.

THE plan which I have followed for the past three seasons in managing sitting hens has given very good results, and I will attempt to explain it with the hope that some reader may glean a kernel of helpful information therefrom.

I use a small room in the barn for sitters, partitioned off for that purpose. For nests I have found nothing better than orange boxes, which generally can be had at any grocery or fruit store for the asking. They are about the proper size, each box holding two hens. They are made so as to give a free circulation of air through the nests, which is very essential to the comfort of the hen in warm weather. I have a hinged door to each box to make it handy in letting the hens off and on their nests. For nest material I use straw.

Being a Leghorn breeder, I have to buy sitters from the neighbors. I gather them at night and place them in the nests on china eggs. They are not let off until the second day after they are put on the nests. After this they are taken from the nests each day and fed whole corn and grit. The hens are often quite wild, but by being gentle with them they soon become quiet enough to place eggs in their care. Each day these hens are taken from the nests, fed and returned again in about fifteen minutes and shut up. This prevents hens from leaving their nests and fighting with

other hens, which generally results in broken eggs. I then darken the room and all is quiet till the next day. By this method I have had hens hatch two sittings of eggs and come off looking well.

When buying sitters it is best to make sure that each one has taken up the business in sober earnestness before they are moved to their new location. Those who sell them naturally desire to get them out of the way as soon as possible, and will often urge the buyer to remove them before they have been broody long enough to be reliable. A hen should sit three or four days before she is transferred to another place. Then, if they are handled carefully and made comfortable during the journey, they will continue to behave well in their new home, even when the surroundings are entirely different. The man who carelessly pulls a hen off her nest, thrusts her into a sack and jolts her home on his shoulder, ought not to expect the hen to sit. But sometimes she does, for some hens can scarcely be induced to change their minds by the harshest treatment.

During the past three years I have bought from twenty-five to forty sitting hens a season and out of this number have had only three which positively refused to sit; and I have had an average hatch of eleven chicks per hen, the season through, by following this plan. C. A. DUTTON.

A HOUSE FOR SITTING HENS.

**A Southern Poultryman Hatches With Hens and Incubators, but Prefers Hens for Brooding the Chicks—
How the Hatchery Is Equipped.**

By F. E. Winge.

I WILL give my way of hatching and plans of the kind of hatching houses I use. On account of oil being so expensive in this locality, and for several other reasons, I consider a kind of half artificial half natural mode of conducting the hatching is the best way. Of course my "better half" gives me a hand and I don't see how I could manage without it, because hired help down here is, to say the least, very unreliable.

We have prepared for fertile eggs and vigorous chicks by selecting our best birds, keeping them in good condition, but not in any way forcing them for the sake of winter

She will as a rule be waiting for this and greatly enjoy a dust bath, a good drink and a quantity of whole corn. Only one nest door being open, there is no one to fight with and she cannot make a mistake in nests, so no eggs will be broken or chilled. After the expiration of twenty minutes, during which time we are employed with something else, we again visit the hatching house, when as a rule the hens at liberty will have resumed their duty. The second hen in each pen is then liberated and after another twenty minutes the third one. Thus we must be at hand for about one hour, but the actual work in caring for all thirty hens will not take more

than ten minutes. The best of it is that any one can be entrusted to do the work now and again should it be necessary.

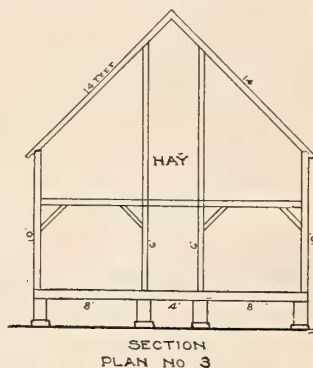
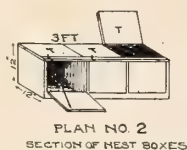
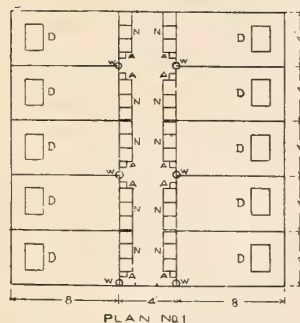
We place a couple of handfuls of mint (which grows wild here) in nest material and there is no trouble with vermin. Above each nest is a piece of pasteboard tacked, with number of sitting, number and kind of eggs, when due, number of chicks and punch mark. When hatch is over it is copied in the hatching record book. It should be remembered that good accommodations for the sitting hens, not only make the work for caring for them easier, but

often are of considerable assistance in securing good hatches. The poultrymen further north, who desire to set hens very early, must protect them from the cold, or good hatches cannot often be obtained. The hen will generate enough heat to keep the eggs at the required temperature during very cold weather, if the building in which she sits offers sufficient protection so that her comb will not be touched by frost and if the nest is deep, warm and snug.

In the south we have less of the extreme cold to guard against, but late in the season we find it advisable to see to it that the sitting hens are afforded some protection from the heat. A hen is not comfortable, and will not often bring off a good hatch when she is confined in a hot-box. The building should be sufficiently well ventilated to keep it fairly cool and frequently cleaned and disinfected to make the air fit for the hens to breath.

On poultry farms, where the natural means of hatching are employed and scores, or perhaps hundreds, of sitting hens must be cared for, the time required to do this part of the routine work is considerable and any plan that promises to decrease the time required, and consequently the expense, for "time is money," is worthy of serious attention.

It is not well to let off a group of hens in the same apartment at one time, for they are almost sure to fight, or cause trouble in some way. To take off each one separately requires too much time. The house and equipment described enables the one in charge to care for the hens in the best manner and the least time. F. E. WINGE.



Plan of House and Equipment for the Use of Sitting Hens Described by F. E. Winge.

eggs, and by keeping two males for each pen, placed therein on alternate days.

I aim to set six hens and to start a fifty egg incubator at the same time, and as soon as the chicks are dry I divide them among the hens, so each hen gets from twelve to sixteen chicks to care for, depending on the season of year. If there are too many chicks, some of the hens waiting for eggs are made to brood them.

We hatch during February, March and April, and in the fall during September and October.

Hatching houses are 20x20 feet. The sills are two feet from the ground. The houses could be made any length, but we use them for curing cow-pea hay in and this size has been found most convenient. They are made entirely of 2x4 scantling and 1x12 inch rough boards. Boards on walls are left one-half inch apart and of course not battened so as to admit air for the curing of the hay.

Plan 1 shows the floor plan with ten pens. I place three sitters in each pen, thus the house will accommodate thirty sitters at one time. The letter N in plan 1 shows position of nest boxes in hallway; A shows feed and grit boxes; W, water pans, and D, dust boxes. As may be understood, all work in setting and caring for hens is done from the hallway.

Plan 2 shows a section of nest boxes without bottom; W is a wire used in closing front door; T top doors; P being nail used for fastening the wire of the front doors.

The pens having been cleaned out, water and feed boxes filled, we begin letting out one hen in each pen at 4 p. m.

THE SITTER AND HER BROOD.

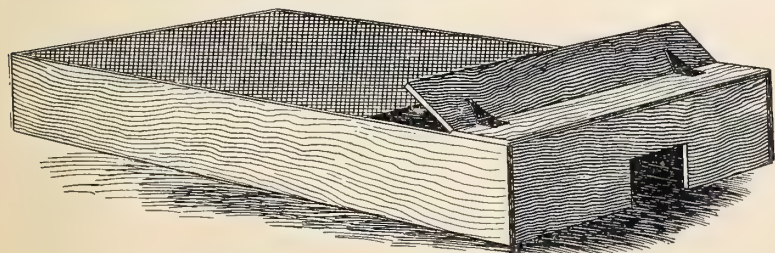
Making the Nest and Setting the Hen—Feeding and Caring for the Hen and Chicks—A Satisfactory Coop and Runway.

By Mrs. S. E. Hurlbut.

THE best thing I have ever found in which to set hens is an empty barrel. Cut a hole nine inches from the bottom end. Make this hole seven inches wide and nine inches high. Put about three inches of dirt in the bottom, leaving it about level. Put in a double handful of tobacco stems or waste tobacco, laying it level, then put in enough fine hay or straw to make a good nest. Put a couple of china eggs in the nest and put in the hen. Stand the barrel on end and put a board across the top for shelter and to darken the nest, so it is more secluded. This also prevents the hen from flying upon the top where she is liable to foul the nest and eggs.

If the hen is uneasy put a board or wire screen in front of the hole in the barrel so that she cannot get out for a day or so. Let her sit on the china eggs for a couple of days so that the nest will be thoroughly warm, then put the eggs under her. Keep plenty of good clean water and ground corn where she can get it and give her a chance for a dust bath. If you have a shed or vacant coop where the ground is dry the bath is assured. You can place several of these nests side by side, as the barrel gives seclusion so that the hens cannot see each other.

After the hen has been sitting about a week dust her with some good lice killer, and dust again a few days before hatching time is due. The cover can be lifted from the barrel to do the dusting and if for any reason you wish to take the hen off the nest you can lift her out without disturbing the eggs. Leave the chicks in the nest at least twenty-four hours after they are hatched, and it is well enough to put a piece of board in front of the entrance, so that the chicks cannot fall out. It often happens that, if one of the chicks gets out and peeps loudly, the hen will leave the nest and brood the lone chick, leaving the others to get chilled. At the proper time take the hen and put her in the coop and give her the chicks. After the chicks are a few days old turn the coop over in the evening and dust the hen with powder, which will work down through her feathers onto the chicks. I occasionally turn the coop bottom side up and sprinkle kerosene thoroughly on the inside.



Runway Used With Mrs. Hurlbut's Brood Coop.

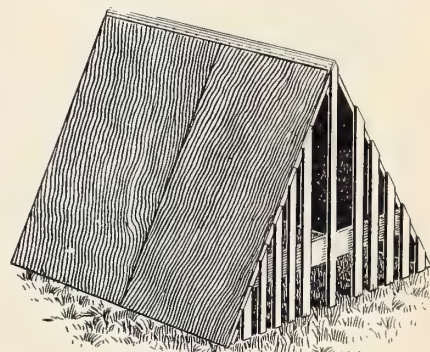
Feeding the Chicks.

The first food given the chicks is usually bread and milk, and for a water dish for small chicks a low tin baking dish, not more than an inch high, is all right. The food I

give after the first day is meal and middlings (equal parts by measure) mixed, with about one tablespoonful of animal meal to one quart of the food. This is thoroughly scalded and fed cool five times a day for about two weeks. After that I feed the mash three times a day and in the middle of the forenoon and afternoon they are fed hulled oats and wheat screenings mixed. I increase the animal meal gradually until they are well feathered out, when I feed about one part animal meal to eight parts meal and middlings—say eight pints of food and one pint of animal meal, or that proportion. I occasionally feed chopped onions, which they always relish, and give them grit and oyster shells. I throw it into the runs and let them eat what they want of it. During the winter, when the hens have picked out the coarse shell and grit, I put the fine grit in a box and keep it to feed to the chicks in the spring.

I keep the chicks in the runs until they are well feathered out, moving the runs as fast as they eat down the grass, in hot weather being careful to place them in the shade. I take the hens away from the chicks when they are large enough, and that depends on the weather. In warm weather they will do without the hen younger than when it is colder. Each breeder must use his own judgment, and in fact the keynote of success is good judgment. There are no ironclad rules that fit all conditions. My yards are about fifty by one hundred feet and well shaded. I put the chicks into these yards when they are about ten weeks old. After the chicks eat off the green stuff in the yards, I feed green food once a day and gradually reduce the regular meals to three times a day. Anything I can get that is green I feed them—grass, clover, weeds, radishes, cucumbers, cabbage, lettuce, green corn, tomatoes, apples, etc., all help. I have a good garden and the surplus goes to them.

After the first hard frost in the fall I let them run at large and they have a picnic in the garden and fields until cold weather. I keep grit and shell in the boxes by them all the time in the yards. I give them plenty of good clean water, keep them free from lice, give them shelter from rains and sun, and when cold weather comes good, comfortable houses. I raise Barred Plymouth Rocks and have no trouble



Mrs. Hurlbut's Brood Coop.

in raising spring hatched cockerels that will weigh nine pounds and over, and pullets that will weigh seven pounds and over by Christmas.

Coop and Run for Hen With Chicks.

I have seen many sketches of coops, runs, etc., and present herewith one that I have used for the past ten years with good success. Some of my friends have adopted this style of coop, and one man says of it, "It is the only thing with which I can have any success in the village, as cats are so

five inches from the bottom, as shown in the sketch. Nail a piece, two and one-half inches wide, in the middle, leaving a space two and three-quarter inches wide at each side. Then nail the rest solid. Nail a board of matched stuff lengthwise on the back, or bevel the edges so the water will shed properly if not matched. You can leave a small hole at the top of back for ventilation if necessary. I usually cover the ridge with a strip of tin to make it water-proof. When the chicks get large enough to jump up onto the cross-

piece and get out, put a piece of one-inch wire netting across the upper part of the front.

To make the runs take a sixteen-foot board ten inches wide, cut in two for the sides, eight feet long. Then take another board and cut two pieces three feet ten inches long for the ends, and two pieces four feet two inches long for the cover and top board. Take four pieces ten inches long, two by two, for corner-pieces. Nail the three-foot-ten-inch pieces to them, place them between the sides and nail them securely. Take one piece of the four-foot-two-inch, place it on the end of the run, lay the other piece next to it and nail it securely. Take two straps or T hinges and hang the first board to the one nailed and you have the door by which to feed and water. Cover the balance of the top with one-inch mesh wire netting four feet wide. Saw a hole for the opening in one end eight inches long and five inches wide from the bottom. Move the coop up to it so that the open-

ing will correspond with the end of the run. On cold nights or in rainy weather put a board in front of the coop on top of the run. This is necessary during rain storms, as the rain falling on the boards will spatter into the coop and make it damp unless protected.

In hot weather I put the coop and run in the shade, and move them every few days onto fresh ground. These measures are not arbitrary, as the runs can be made longer or shorter, or higher, to suit the fancy of the breeder. I am giving you a general idea. The cover and board adjoining make a good shelter for the chicks to feed under when it rains and furnish a shade when the sun shines.

MRS. S. E. HURLBUT.



A Prosperous Brood of Prospective Money Makers.

thick they get all my chicks if they are allowed to run." This coop is proof against hawks and crows as well, or anything that does not dig. I like the old-fashioned A coop for several reasons. The chicks can get down near the bottom of the coop under the sides, and if the hen scratches they are out of the way. They are cheap and easy to move, are water-proof and easy to free from vermin. I cut the sides thirty inches long, twenty inches wide, using ten-inch wide boards with a batten of tin or wood over the middle joint. Take three pieces of board, one by two, one for the ridge pole, and the other two for battens near the bottom. Nail these to the sides, as shown in shaded places in front of coop. Take a piece, one by three, and put across the front

REARING CHICKS NATURALLY AND ARTIFICIALLY.

The Difficulties and How to Avoid Them—Conditions That Affect the Health and Growth of Young Stock—Hatching and Brooding—Feeding Chicks With Hens and in Brooders—Soft Food Best to Produce Early Maturity.

By H. E. Moss.

THESE is such a multitude of "Don'ts" associated not only with the poultry, but with every other business that to attempt to enumerate them would be an endless task. What is often called "horse sense," or good judgment, or brains, must determine between the right and the wrong; but many occasions will arise where experience is necessary upon which to base judgment and where the experience of others can be had and applied. It is equivalent to so much time and money saved, for without it we must test the question ourselves and if found to be a failure it is just so much paid for experience or paid up capital. We shall, therefore endeavor to be as clear and explicit as possible, assuming that the large majority who will avail themselves of this advice are amateurs or beginners who are willing to profit by the experience of others, and to whom success or failure means much. We shall avoid the don'ts and write from the positive, not the negative viewpoint.

The rearing of domestic poultry should show a profit and will do so in proportion to the intelligence with which it is conducted precisely as in any other business; but where the highest order of talent is employed, the profits on the capital invested will far exceed those in any other legitimate business.

We Will Start With the Chick

As it emerges from the shell. If the eggs begin to pip in the evening they should all be excluded by the next morning. In cool weather compel the hen to keep her nest for twenty-four hours longer; this will permit the chicks to sleep and gain strength, which they will very rapidly, as the absorption of the yolk now begins and the new functions are fully established. Then remove her with the brood to the coop, but before doing so, dust her thoroughly with a good insect powder and apply a little grease or oil on top of the chicks' heads and under the wings. This will prevent much future trouble in fighting lice. This should be repeated once a week until they are past danger and can dust themselves in soft moist earth as their instinct teaches them.

Have Your Coops Ready.

In severe cold weather they should be placed under shelter, but where they get as much direct sunshine as possible. An open shed facing south or east is preferable where the chicks can have a dry run when a late snow covers the ground. A gravel or sand floor is very desirable, and if dry, will be found very satisfactory. Your coop will require no bottom, but can be shifted its width every day, thereby insuring a clean floor. Otherwise a wooden floor is indispensable and should be covered with chaff, fine litter, ashes or any suitable material and renewed frequently.

Food and Warmth

Are now the two factors upon which success depends. The latter need not be considered here, as the hen is to

brood them, and she will take care of them; but in cold weather we render it more comfortable for them by placing the coop in a sheltered location, at the same time allowing the chicks liberty to run in the sunshine during the middle of the day. Should the snow be deep, clear a place for them. They thrive better, grow faster and make stronger, hardier fowls than the later hatches that have the extreme heat of summer to contend with before they are half grown. A long protracted hot spell checks their growth in a very marked degree. Cold does less harm than heat, provided they can run under the hen and get warm whenever they are so inclined, and if the hen or the warmth is always to be found when they want it, there is little danger of them becoming chilled. The best results will usually be had where the hen is kept in her coop until the chicks are weaned, thereby compelling her to hover the chicks whenever they demand it and avoiding the enforced excessive exercise she would often subject them to, tiring them out and making them leg weary. Scatter a shovel of sand in front of the coop, which will serve as their first grit. Have a feeding board or trough ready; also drinking fountain, which wash out daily and keep filled with pure water. After your chicks have been out of the shell thirty-six hours, give them a feed of stale bread crumbs soaked in milk and squeezed almost dry. They will eat sparingly at first, as they should. They have been nourished by the yolk which was taken into the abdominal cavity just before hatching and they would not suffer from the lack of food for three days. The bread and milk does not overtax the delicate digestive organs, which as yet have been unemployed, and it cleanses the crop, gizzard, and intestinal tract and prepares it for its functions. Feed every two hours for the first three days, but only what they will eat up clean each time. Little and often is the rule for little chicks up to ten days old, then the capacity of the crop increases and the intervals can be lengthened.

We have seen so much of the hard boiled egg nonsense and the fatality from it that it is surprising that any one should recommend it. Others will advise corn meal, johnny cake, meat stew, hash—anything. Now, it would be just as consistent to feed these things to a new born babe as to a chick. It has been done and no doubt some survived, but only because green food happened to be accessible, and the chick after eating the poison, found the antidote. A dog can eat Rough on Rats and then drink a pan of milk and suffer no injury, but that does not justify me in advising it as a steady diet for dogs. Those who prefer the dry grain ration should after the third day use pinhead oat meal and a little millet seed until they can eat cracked wheat, finely chopped corn, and hulled oats, which latter should constitute the main food for a growing chick. Add to this a little millet or chopped sunflower seed with a little (very little) cut green bone or lean meat daily after they are ten days old, the amount depending on the season

and the number of insects and worms obtainable on range. Green food or bulky vegetable food should be fed daily and as regularly as a horse or cow is fed hay. It is just as essential and serves the same purpose in the digestive process in one case as in the other. Accustom them to eat whole wheat, buckwheat and cracked corn as soon as possible.

A Preference for Soft Food.

Our preference and that of many others, especially where the chicks are raised for market, is soft food, for two reasons: First, because we can combine all the necessary elements and secure the proper ratio of food constituents at each feeding. They cannot select certain seeds or particles which they prefer and waste the remainder, as they will in dry feed. They usually hunt out all the millet seed first, as this is "candy" to the little chicks and a luxury even to old hens. Bury a handful under a haystack and they will leave no straw unturned until they find it. No matter how accurately we figure out our dry feed ration, we can't force them to eat the less palatable after they have filled up on "candy" and our calculations are knocked out. Second, because a soft, properly compounded food needs no accessories

will be very eager for the next feed. When they are not, there is danger ahead. Never feed all they will eat up by lingering over the feed trough. They will overload their crops if permitted and where dry food is given, especially rolled oats, the swelling takes place in the crop faster than the food is passed into the gizzard and often proves fatal. An excess of bran is also dangerous. A little is necessary in some cases and desirable in others, as the husk or shell acts as a stimulant to intestinal action, but an excess causes irritation and bowel trouble.

The above is comparatively an easy matter to follow, for when natural brooding is employed more than half of our anxiety is removed, and when the business is to be conducted on a small scale this method will answer, but where large numbers are to be hatched and grown, any but the artificial system would be entirely too laborious and out of the question. The above being fully understood, the only change to be considered is

Artificial Brooding.

Unless we can furnish a uniform and constant supply of heat of the right temperature trouble begins, and once

begun there seems to be no end. Get this one fact clearly in your mind, that warmth is more essential than food in handling an incubator brood. They will manage to live on almost any kind of food even if they do not grow and thrive, but variable heat in the brooder is fatal. The chemical and nutritive changes that food must undergo in the digestive process can only be carried on at a high temperature. This is the vital temperature; below it the process ceases. This at once checks nutrition. Doctors describe health as the perfect har-

mony of nutritious changes, or physiological ease. If the temperature of the body falls below the vital point, nutrition is disturbed and disease follows. If the chick is chilled before the yolk is fully absorbed, nothing will save it. The nutritive process has been checked. What food is taken afterward passes wholly or partly undigested and death soon follows. Fatal as cold is when prolonged to discomfort, it is necessary after the chick has learned where to run to hover and get warm, to allow them a little exercise in an outside run in moderately cold weather when they can take in the sunshine. If left to their choice, they will seek the warmth before they become chilled to the danger point, provided they know where to find it. Here is where the artificial brooder is better than many old hens, that often keep going, no matter how cold it is, while the chicks cry and beg for the warmth that is denied them. Their plaintive peep is sure sign of discomfort, and whenever it is heard it is high time they were looked after. Where chicks are to be raised by the thousands for market, artificial incubating and brooding must be adopted, as it would require too much help at too great an outlay to make it profitable with hens under the natural method. Three sitting hens would cause me more trouble and annoyance than one incubator, and with their broods would require as much attention as a brooder house holding several thousand.



A Flock of Chicks That Will Grow Fast if Well Fed.

except green food, which is imperative in either case, and it saves much energy which would be expended by the chicks in grinding it. Bear in mind, we are raising these chicks for profit and not as pets. We must, therefore, force them to the limit of their ability to eat, digest, assimilate and grow. Quick maturity is what we desire. In order to achieve this we must meet all the demands made by the growing powers for material to grow on. You can't deceive nature. If it calls for nitrogen, carbon will not answer; if it calls for water, nitrogen will not serve, and any ration that is not balanced as it should be feeds one side and starves the other. If any system of feeding could be devised whereby we could mature a chick in four weeks, we should all quickly adopt it, and if we were raising chicks exclusively for market we should not depart from it. Again, a ration may be balanced and its ratio of protein (albuminoids) to carbohydrates, free fat, and mineral salts properly determined and yet fail, as it surely will if the protein is derived exclusively from vegetable or grain sources. The experiment stations have lately proved this fact, which some of us discovered long ago by costly experience, at that time our only teacher. A ration bearing precisely the same nutritive ratio but with a certain percentage of animal protein will be highly successful, but if lacking it they famish and die from starvation in the midst of apparent plenty. A chick properly fed

The Brooder House

Must be warm and dry. There are many good plans published. One that will be found very satisfactory is sixteen feet wide, four feet high in front, and six in the rear with the hip of the roof plumb with the face of the hover so as to allow head room in the passage. Divide your space into three feet at the rear for a walk; two feet for width of hover and eleven feet for pen. This building can be extended any length desired. Don't attempt to heat the hovers with lamps in any latitude north of Birmingham, Ala., or you will fail. You might be able to get the temperature under the hover high enough, but the pens would be chilly and there is where they must spend the greater part of the day if they are to thrive. Use a water jacket stove and double loop of inch and a half pipe in the hover and a single loop under the windows, of which there should be one in each pen, raised twelve inches from the floor. Make the pens four feet wide, this with eleven feet in length outside the hover is sufficient to start one hundred chicks in, but they must be thinned out as they grow older. A movable lid over the pipes is all the hover consists of. They will be contented and scratch and exercise all day long and run under the pipes when they wish extra warmth. No curtains are required when the building is heated as we describe. They are undesirable at best. When the hover is curtained off it often is allowed to become filthy, and impure air and ammonia fumes are held there for the chicks to breathe. If the hover registers too high a temperature and the pens too low, lift or lap the covers so the heat from the pipes can rise more readily.

Crowding works much mischief. Outdoor and indoor brooders heated by lamps are frequently rated at too high a capacity. If one-half the chicks were assigned to them there would be less loss and better chicks. The action of the chicks is a perfect indication of their feelings. Whenever they stand around humped up and chirping, they are in danger and are losing ground instead of gaining. In ordinary winter weather they should be given access to the outside runs for a few hours when the sun is bright. They are better for it and will run in and get warm when they feel inclined.

Keep your supply of coarse sand and fine grit and clean drinking water constantly before them. After they are ten days old they are quite hardy and practically safe; and if properly fed and of breeds suitable for broilers they can be made to weigh one pound in forty days, one and a half pounds in fifty-five days and roasters five pounds each at four months. When reared with small yards for exercising they move about much less than when on free range, and while they have sufficient exercise to maintain good health, they have not sufficient to waste energy or flesh or toughen their muscles. They gain in weight more rapidly and make heavier, plumper broilers in a given time.

Feeding Brooder Chicks.

I use three distinct mixtures of food between hatching and marketing time. The first ten days I take special care

of their digestive organs and prepare them for the active work demanded from the eleventh day until two weeks before marketing. I feed a narrow ration, the basis being oats in some form. I then hasten the finishing with the best possible material, adding more corn, and aim to add flesh faster than frame or feathers and to distribute what fat is deposited in globules throughout the meat, making it tender and juicy instead of accumulating layers of internal fat or patches under the skin, all of which is wasted and lost in cooking and serving the fowl. A properly fattened fowl should not show any visible fat when dressed, but not one in a thousand poultry raisers knows how to put meat on a growing chick, and the only way they can turn out what might pass for a plump broiler or roaster is to work on such breeds as develop the quickest and then cover them with as much fat as possible in addition to the meat. This is all wrong. Soft, tender, juicy meat and a round, plump breast is what is wanted and the fatty delusion must stand aside.



These Chicks are Housed in Permanent Buildings and have Large, Well-shaded Runs.

No one grain has so great a tendency to deposit internal fat as corn, and this is the very last source we should go to for flesh forming food. I believe that in the near future our best markets will demand machine crammed or crate fattened poultry. They have for many years demanded crammed ducklings. The only reason they have not been known by this name is because no machine is necessary to cram a duckling—he will stuff himself if given the food.

The rations fed for any specific purpose may vary greatly as to material, and in different localities will naturally be compounded of the most available material if suitable, but for a growing chick they should always consist of oats (minus the hulls) in some form as the base, and this forms one-half the ration. Other grains can be varied, whether cracked or ground, but five per cent of the bulk must consist of meat or ground bone in some form after they are ten days old as well as an abundant daily supply of succulent green food or steamed clover. If you omit the meat or green food trouble begins and shows in weak legs, naked bodies, stunted and uneven growth and blue, skinny carcasses when dressed.

H. E. MOSS.

BROODING, COOPING AND FEEDING CHICKS.

A Writer who is Regarded as Authority Discusses Brooders and Brooding, Foods and Feeding, and Describes the Proper Care for Chicks of Different Ages.

By A. F. Hunter.

HATCHING the chicks is but half the battle, if, indeed, it is half the battle, as many a poultryman who has rejoiced in good hatches by either hens or incubator has afterwards learned to his sorrow. With incubator chicks raised in brooders elbow room seems to be a most important factor, and want of elbow room is one cause of great mortality in brooder chicks. It is quite natural to suppose that a brooder which is three feet square (giving nine square feet of floor space), is abundant room for seventy-five or one hundred chicks, and, indeed, it is for chicks as they come out of the incubator, and if we do not want our chicks to grow it is all right to crowd into a brooder twice as many as should be in it. A point that we should keep in mind, however, is that these chicks will be fully twice as large at three weeks old and probably four times as large at five weeks old, or by the time we move them from the brooder, and that factor we should have in mind in gauging the capacity of a brooder. I have come to believe that for good results fifty chickens are as many as should be put in any brooder; that to increase the number beyond that point is to induce crowding, which kills some and stunts others, and is extremely unfortunate if quick and profitable growth is our aim. If, as not infrequently happens, we find we have one hundred and fifty chickens in the incubator when we only expected about one hundred, and have but two brooders heated up to receive them, no harm will result in putting seventy-five chicks in each of the two brooders for a couple of days, but another brooder must be made ready at once and the one hundred and fifty chicks put into the three, which gives reasonably abundant room for all of them and they have a good chance to grow.

We raise chickens on our farm for two purposes, first for market, second for breeding stock. The chickens for market are hatched usually from about Christmas time to the middle of March. Those intended for breeding stock are hatched from about the middle of March to the middle of May. To have chickens out by Christmas time we have an incubator started early in December, and at that time it is our custom to start one incubator a week, or, possibly, four incubators in three weeks, gradually increasing to two incubators a week through January and February, and so on. For these winter chicks we have a brooder house 130 feet long by ten feet wide, partitioned into sixteen pens eight feet by ten feet, each pen having a door and window in front which faces the south. This brooder-house is double walled, with a four-inch air space between the inner and outer walls (it would be better still if the wall and roof spaces were packed with straw or swale hay), and the only artificial heat used in this house is in the brooders themselves, excepting that in some severely cold weather we put a small oil stove in each pen to take the chill out of the air, in order that the chicks may be out in the pen. We use brooders which are three feet square, heated by an oil lamp with a one and one-half inch wick, the air which passes into the brooder being heated by passing over a sheet iron ceiling to the lamp chamber, and by this method of applying the heat indirectly a slight current of warmed fresh air is passing into the brooder all the time. Herein, we think, is one of the great faults with many brooders, as, for example, the hot-water pipe brooders in use in many brooder houses. Those hot-water pipes simply heat the air already within the hovers, which air is practically confined

to the hovers by the felt curtain in front, which is supposed to enclose the warmth within the hovers. It does that very well, but it likewise encloses the air, which the chicks have to breathe over and over again, and in that defect I think we find a clue to not a little of the mortality and consequent shrinking of profits on brooder house chicks. A current of warmed fresh air supplied to the hovers would overcome this serious difficulty, and would, in my judgment, materially reduce the mortality of brooder chicks.

The brooders are set in the ground to a depth of six or seven inches, which serves a twofold purpose. The lamp chamber is enclosed so as to cut off currents of air, and the chicks run out and in upon a level. For our winter chickens the brooders are set in the middle of the pens in the brooder houses, or, say, about four feet back from the window, and two



PART OF LONG BROODER HOUSE.

The Foreground Shows Brooders Out of Doors, Each Brooder Enclosed in a Pen 20 Feet Square, Made of 18-inch Netting.

pieces of board are fitted into slots at each front corner, extending to the side of the pen, so that the chicks are kept in that warm, sunny half of the pen until they are a week to ten days old. The first day after being removed from the incubator they are usually kept confined to the brooder, the food being put on small platters placed in the corners of the brooders for them. After they are old enough to be let out they are fed and watered outside, just in front of the brooders. These winter chickens will need the warmth of the brooders until they are seven or eight weeks old, but the temperature of the hover is gradually reduced from 95 degrees at the beginning to 90 or thereabouts at the end of the second week, then to 85, then 80, then 75, and the last week or so that the chicks occupy the brooder the flame of the lamp is kept as low as it can be run, to give just the least amount of warmth, 65 to 70 degrees being sufficient.

The chickens that we raise for breeding stock are brooded out of doors (it being our custom to begin setting brooders out about April 1st, the brooders being set in the ground, just as formerly inside the brooder house, but as we have much rainy weather in April and May, we have "shelter boards" to serve as protection from the rain, set a little way in front of the brooders, and under which the chicks can take refuge from storms. The chicks put out of doors are kept within the brooder for about one day, then a little pen a yard square made of three pieces of board three feet long set up to the front of the brooder gives them a snug little enclosure for the few days of babyhood. Next we make a pen about twenty feet square of one-inch mesh wire netting tied to temporary stakes, and the chicks have the range of this pen until they are big enough to be weaned from the brooder, which, in May and June, is at about six weeks old. Then they are moved back to a grassy ridge bordering the pasture on one side and mowing field on the other. There they are colonized in "A" coops (as we call them) for five or six weeks, when it is time to separate the pullets from the cockerels, and put the pullets out in the grass fields, in roosting coops, in families of about twenty-five each, colonized about fifty yards apart. The cockerels intended to be raised for breeding are confined in pens about 50x100 feet, while the cockerels intended for market are taken back to the pens in the brooder house, which have small yards 10x20 outside, and there they are fed and grown for market.

The coops for these chickens play a not unimportant part in chicken raising, and a brief description of them may be interesting. The "A" coops are three feet six inches by two feet three inches on the ground and two feet high at the apex of the roof. They are built throughout of half-inch tongued and grooved pine and well painted. The front is all slats, as shown in the illustration, with a slatted gate sliding in grooves to close the front. We originally built "A" coops to slope down to the ground, but found it an improvement to have a square base four inches high, with the corners turned to an angle, to prevent the chicks from crowding back under the eaves and smothering one or two at a time. We find it a most decided advantage to have

these well built coops always at hand, and as we have coops now in use which were built ten years ago, and are as good to-day as when made, the economy of well made coops will be apparent. When we say that the tongues and grooves of the roof pieces are painted before they are put together, the



BROODERS AS USED OUT OF DOORS.

The One in Foreground has a Very Small Pen for Baby Chicks.

reader will realize that they are thoroughly well built.

The roosting coop, which is chiefly intended for raising the pullets in, is six feet long, three feet wide, two feet high at back and three feet high in front. The roof, ends and back side are all of half-inch tongued and grooved pine, the front being laths, set a lath width apart, except that a strip of board is nailed to each corner for stiffening. Two roosts stiffen it. A coop like this will comfortably house twenty-five to thirty chickens until they are nearly grown; in fact, we sometimes have pullets begin to lay before they are brought in from those roosting coops. It is quite light and can be easily moved on a wheelbarrow, or moved its length and width to fresh ground, or it can be tipped up and droppings removed, and it is a perfect summer shelter. If they are to be used in the spring or fall, when the nights are cold, an improvement would be to make a front of half-inch boards, hinged at the top edge, so it could swing outward and upward and rest upon folding legs hinged at the bottom corners, which would become a roof to shelter the birds from rains. One disadvantage of this light coop is, that it may be easily tipped over by a high wind, especially when the chickens are all out of it, as during the day. To prevent it from so tipping over a flat stone should be placed on each front corner of the roof.

The gate space in front of the coop gives access to the whole inside when the pullets are to be removed. The gate is made of laths nailed to two strips one inch square, the left hand ends of which are long enough to slip in behind the lath front, the right hand side being secured by one or two buttons. If one prefers, these gates can be hinged at one side or the other and secured by a hook or a button, but of two by three scantling, slightly rounded at top, run the whole length and are a foot apart, being securely nailed to a frame of furring (one by three stuff) nine inches from the ground. To this frame we nail the ends, back side and front corner boards and then fit in at the top a frame of inch-square stuff to nail the roof boards to and

we have found it a convenience to have them wholly detachable, and so make them.

Shelter from rain and sun is of quite as much help as a good coop to sleep in. By experimenting in different ways we learn that it would pay as well to have "shelter boards" always ready, just as are the coops; hence we make them of the half-inch, tongued and grooved pine, taking five strips three feet long by six inches wide for each shelter board. These strips are securely nailed to pieces of inch-square spruce at top and bottom, and then the weather side is well



The A Coop.

painted. We make a light frame of the inch square spruce strips and laths to fit up to the "A" coops when we want to put the shelter close to the coop, using one of the 2½x3-foot shelter boards, as shown in the illustrations. As the chicks get a little older we move the frame out a little, set athwart the front of coop, and put two shelter boards over it side by side, setting it so that it furnishes shade if the sun is shining, or protects from a driving rain, of course adapting it to the direction of the wind.

When we move the pullets out into the field and into the roosting coops we set upon stakes and a strip of furring, a shelving roof seven and a half feet long by three feet wide, slightly sloping to the south, about eighteen inches high in front and a foot high at the back. By these devices we more than double the available shelter from rain and sun and correspondingly increase the comfort of the growing chicks. Obviously, if they have to be crowded into their narrow sleeping quarters on a long rainy day or to get away from the hot sun, they are not making good growth, and by so simple an expedient as we have here outlined we more than double the protection and by so much promote their comfort.

Foods and Feeding.

As we stated at the beginning of this article, we raise two kinds of chicks, chickens for market and chickens for breeding stock. The food for the first month or six weeks is practically the same for each class, but at the end of six weeks we begin to feed the market chicks a richer and more fattening food, they of course being kept separate from the chicks intended for breeding stock.

Feed often and feed but a little at a time is the rule for young chicks. We feed five times a day until they are about six weeks old. It is important that no food be left standing for the chicks to trample dirt into or to get sour in the sun; if they have not eaten it all in twenty minutes to half an hour, remove it. Nothing causes more bowel looseness and dysentery than sour food. Our chief foods for the first six weeks are coarsest oatmeal, slightly moistened with sweet milk if we have it; if not, with water, and waste bread ground to rather coarse crumbs in a bone mill. This also is moistened with sweet milk or water,—slightly moistened so that it is still crumbly and not "pasty." The oatmeal is just such as is cooked for a breakfast dish on our table; in other words, it is oat meats ground very coarse. This we buy of wholesale grocers, by the barrel, at a cost of about two cents a pound. The waste bread is the broken pieces, part-loaves, rolls, corn cakes, etc., from hotels and restaurants and costs about a cent and a half a pound. This

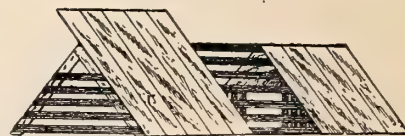


Roosting Coops for Large Chicks.

bread we buy by the hundred weight and spread on the barn loft to dry; when thoroughly dry it is ground into coarse crumbs in a bone mill. The first food early in the morning is the bread crumbs, slightly moistened with sweet milk or water; the second, about nine o'clock in the morning, is oatmeal, slightly moistened a little before noon, bread crumbs again, about half past two oatmeal again and about 5 o'clock a little cracked wheat or finely cracked corn. Twice a week a little lean meat is boiled, chopped fine and mixed with one of the bread or oatmeal feeds, or the infertile eggs (clear eggs) from the incubators are boiled hard, chopped fine, shells and all, and mixed with the bread crumbs or oatmeal.

It is very important that the chicks have grit to grind their food, and as baby chicks are hardly to be trusted to supply themselves with good grit, we sprinkle a pinch of fine grit (or coarse sand) upon the small tin plates once a day just before feeding, or, if preferred, it can be mixed into the food. Grit in the gizzard to grind the food is a most important factor in preventing indigestion and looseness of the bowels.

Green food is another important aid to good health. If the chicks are cooped upon fresh grass the problem is easily solved, because they will help themselves. Obviously, the January, February and March hatched chicks cannot have access to fresh grass, neither can the larger chickens shut up to be fattened for market, hence a supply of green food must be provided. Cabbages, onions, lettuce and onion tops all make a good green food supply, and the same can be said of weeds from the garden, which are easily obtained. It is a comparatively easy matter to supply the green food if one has the will.



As a Shelter from Sun.

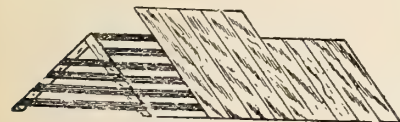
We are well aware that many readers cannot get waste bread from hotels and restaurants, and to such we recommend the making of "johnny cake" of mixed meals, baked very thoroughly, and we will give also the rule for "Excelsior Meal bread" as recommended by Mr. I. K. Felch. "Grind into a fine meal in the following proportions: Twenty pounds corn, fifteen pounds oats, ten pounds barley, ten pounds wheat bran. Make the cakes by taking one quart sour milk (or buttermilk), adding a little salt and molasses, one quart of water in which a large heaping teaspoonful of saleratus has been dissolved. Then thicken all to a little stiffer batter than your wife makes for corn cakes. Bake in shallow pens until thoroughly cooked. We believe a well-appointed kitchen and brick oven pays, for in the baking of this food enough for a week can be cooked at a time." It is very certain that a cooked food of this kind is a decided help to good growth in chicks, and as we on our farm want a good growth, we study to promote it by feeding a good food.

Not a few farmers and poultrymen think that oatmeal as a food for chicks is a luxury. Wright's "Practical Poultry Keeper" says: "With regard to feeding, if the question be asked what is the best food for chickens, irrespective of price, the answer must decidedly be, 'oatmeal.' After the first meal of bread crumbs and egg no food is equal to it, if coarsely ground, and only moistened so much as to remain crumbly. The price of oatmeal is, however, so high as to forbid its use in general except for valuable birds; but we should still advise it for the first week in order to lay a good foundation."

We are obliged to differ from Mr. Wright as to oatmeal being an expensive food for chicks. It may look expensive to pay \$4 a barrel (two cents a pound) for oatmeal for chicken food; but it goes so far we have found it a decidedly economical food. We use perhaps fifty dollars' worth of oatmeal a year and it makes about one-fifth of our chicks' food ration for the first three months of their life. Considered simply as a food ration it is economical, but when we consider that is a good foundation for the future usefulness of the birds, and that a good foundation for chicks means eggs in the basket next fall and winter—then we realize that oatmeal is a cheap food in the best sense of the term.

By the time the chicks are six to eight weeks old the principal dangers of chickenhood are past and the two different methods of feeding are inaugurated. The chickens intended to be raised for breeding stock are put out in the fields, where they have a grass run and a free range. The chickens intended for market are kept confined in the brooder house pens and yards and fed a slightly different grade of food. The principal difference is in increasing the amount of cracked corn and corn meal of the market chicks and cutting off the oatmeal, of course the green food being plentifully supplied and grit being constantly accessible. The chicks in the field intended for laying and breeding stock must have a liberal supply of nourishing, strengthening food, which will build up a strong, healthy and vigorous body, with stores of strength to lean upon when maturity shall come. The breakfast is bread crumbs, continued usually until the chicks are about ten weeks old, when they are graduated into a morning mash of cooked vegetables (which makes about one-third of the whole) and mixed meals, being equal parts by weight of corn meal, ground oats, fancy middlings and bran (or shorts); this is salted about as it would be if it were food for the table. The vegetables are potatoes, beets, turnips, carrots, onions—anything in the vegetable line, thoroughly cooked and mashed fine, the mixed meals being stirred in until it is stiff as a strong arm can make it. The breakfast in the morning is this mash; in the middle of the forenoon a light feed of coarse oatmeal, moistened; just after dinner a light feed of cracked wheat and about five o'clock whole wheat or cracked corn, one one day the other the next. About twice a week we have fresh meat (butcher's trimmings), which are boiled and then chopped fine. This we mix with the oatmeal (about half and half) for the second feeding. We have also a bone cutter and twice a week the chicks have a good time wrestling and trampling over each other in their eagerness to get the fresh cut bone. Cut bone, if perfectly fresh and sweet, is one of the best

animal food supplies that we have, but, if this is not available, meat meal or beef scraps should be mixed into the morning mash, about one-



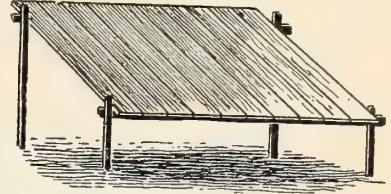
As a Shelter from Rain.

quarter ounce per bird per day, for young birds, increasing to about one-half ounce per day as they approach maturity.

We vary the food ration continually within the range here described. For instance, one day the food will be mash, bread crumbs, cracked wheat and cracked corn; next day, mash, oatmeal and chopped meat, cracked corn, and whole wheat; the next day bread crumbs, cut bone, oatmeal, cracked

corn and so on. The intention is to feed only what the chicks will eat up clean and quickly; but we break the rule so far as the last feed is concerned and the boy goes around a second time twenty or thirty minutes after feeding, and if the food is all eaten up clean three or four handfuls more are put down so that all shall have a chance to "fill up" for the night. If a handful is left uneaten it quickly disappears in the morning, and as it is always dry grain it does not sour and there is no danger from leaving it out.

We have said nothing about fresh water because it goes without saying that fresh, clean water must always be accessible to the chickens. We water them three times a day, morning, noon



A Shed-Roof Shelter.

and late afternoon; sometimes going around between whiles if it is hot weather and the chickens are likely to drink a good deal. The water dishes are carefully rinsed once a day and water which is fresh and cool is always accessible to them. Grit to grind the food is another necessity, a pan of which is placed near each food trough out in the field, or a small box of it in each pen in the brooder house. We have personally noted that chickens when let out of the coops in the morning would go to the grit dish for two or three bits of grit before going to join their mates at the food trough.

Thus far we have been writing about chicks raised for breeding stock. When the market chicks are six to eight weeks old we cut off the oatmeal (or ground oats) from the food ration, double the quantity of corn meal and cracked corn, feeding also on wheat or barley, feeding them occasionally, say once a week, a feed of whole oats for a change. The corn meal and meat meal are gradually increased and a week to ten days before the chickens are to be marketed a very little gluten meal is added to the ration and the meat meal practically doubled in quantity until we are feeding a full ounce per bird per day. With this decidedly fattening ration the birds should go to market in first-class condition and bring top prices for market chicks.

The chicks intended for breeding stock have free range and can roam over the fields at will in search of insects, worms, etc., the exercise of ranging promoting growth and good health. We study to promote the comfort and well being of the chicks, believing that it pays to do so. The coops are kept scrupulously clean by being moved to fresh ground every other day, and every reasonable pains is taken to insure steady, continuous growth. It is the full egg basket in November, December and January, when eggs bring top prices and pay the creamy profits, that is being planned for and worked for in this good care and good feeding, and we have abundantly proved on our farm that this good care and good feeding pay richly. We cannot get a valuable thing for nothing; the good things in this world come by working for them, and the good profits that are to be gained in poultry raising have got to be worked for. With us the problem is early hatched pullets kept growing so that they shall come to laying maturity in October, and then kept laying. Our pullets are kept growing, and after they reach laying maturity are kept laying, by good care and good food.

A. F. HUNTER.

JUNE HATCHED CHICKS.

Mr. Sewell Recalls Prominent Winners That Were Hatched In June—To Produce Them One Must Study Nature's Whims and Prepare Alike for Rain and Shine.

By F. L. Sewell.

WE BELIEVE chicks come into the world with the best conditions for rapid growth at the time of fruit blossoming. That is about the middle of May in this latitude—but in seasons so backward as some are, June is not a bad month in which to start.

Rearers of pheasants look to this month as their best season for hatching—when the season is well settled and rains are not too frequent. The haying season is the time when the quail hatches her first broods. The June hatched Mediterraneans, Games, Hamburgs and some others will require no special urging to bring them into fine form and feather for the early winter shows. Our ambitious fanciers



June Hatched and Vigorous.

who are not content with any but the very large breeds, weighing eight to twelve pounds, must remember that they are handling races developed through artful selection and most advantageous environments.

The fancier who sets out to win in the present day competition at our best shows and reap the high prices that are paid for the prize-takers will keep in mind that every day must bring gain in growth to his June chicks; he will see that they have everything that adds to their comfort and are well protected from all that retards their growth or spoils their general condition and plumage.

No doubt at the winter show you have stood admiring some splendid specimen in the American classes or even of the grand Asiatics and a proud owner assured you that the bird was "only a baby—a June hatched chick," and you wondered how he produced such freshness of feather—such perfection of bloom; and a question brought the reply, "Why he has not had time to lose it—he just seemed to grow every day from the time he was hatched until now." Therein lies success—not an hour's neglect when natural, healthful

development could lag. Many of the finest show birds we have seen at the great eastern shows of New York and Boston we have known to be June hatched. It is an old saying among the fanciers that pullets appear at their finest just the few weeks prior to laying their first egg, and if the show birds can just reach maturity on show week they will appear in the pink of condition—with vigor at its height and the plumage at its finest.

We mentioned the settled condition of June weather as being favorable; however, a protracted dry season may be far from beneficial, when a liberal supply of green and insect food cannot be obtained. No birds can grow well without them. Between a season of continued droughts and excessive rains we would choose a season where the birds had proper protection—dry coops and covered runs attached for wet days. Between showers the birds will find abundance of green food, insects and worms, while in the season of drought they are apt to lack for both these. It is always a safe provision to have a patch of young clover or some good crop for green food. We know of nothing better than a small field of white clover that can be watered and kept green (a part to be cut for winter use) for the birds to forage over. During continued dry weather when the surface of the soil seems to present no insects or worms a strip can be occasionally plowed up, giving a fair supply of worms and bugs. A pile of small chips and partially decayed leaves will afford excellent scratching, especially if partially in the shade. Insects are constantly gathering in such a place. The perfectly clean swept poultry yard may look to some eyes most tidy, but to the chicks that hanker for a hunting ground where they may stir up bugs or worms such a place without its rubbish pile is a mockery to their nature. A few wagonloads of old rotten wood and leaves from the forest present a constant picnic to the chicks in summer. Place the pile partly in the shade. The frequent visits to it by the chicks will prove their appreciation for it.

The exercise taken in scratching for the insects will induce thrift and add to the strength of the birds. Have you not frequently received among your purchases, birds seemingly lacking in all thrifty habits actually spoiled in their bringing up? Some breeds, notably those nearest the original type of the wild Bankiva fowl, hunt all day, turning over the leaves as they search about, while others seem to care for nothing beyond the dooryard and the granary. This disposition and habit can be largely due to the methods employed in feeding while the chicks are growing up. A certain amount of range, encouraging the chicks to hunt and scratch for at least a part of their food, will add value to the birds in health and thrifty foraging habits. These last remarks apply especially to chicks leaving the brooder or hen in a dry season when the natural food may be scarce and the temptation strongest to depend entirely upon the feed bucket.

We learned through sad experience not to allow chicks

to nestle or roost upon the bare ground. There should always be a board platform raised a few inches above the earth, keeping the birds dry under foot at all seasons.

We note that small, movable coops for weaned chicks are rapidly growing popular, a number of very practical patterns now being made to take down and ship in a small space. We know that the value of these movable coops can hardly be estimated. With such well planned and convenient coops the chicks can be constantly on clean, fresh ground and with the movable covered runs attached the long rainy days are not nearly as much to be dreaded by those ambitious to see their birds growing every day. Much of the failure to succeed with young turkeys and pheasants

during the last two seasons is due to the lack of this kind of protection. The fine young chicks can be weathered through many a wet week to our entire satisfaction and the coops made to pay their way many times over in the saving they will be to young stock, among which we look for our next winter's prize winners.

With vigorous parent stock we always expect to produce rapid growing chicks, and with constant attention to securing for them the best foods and giving them protection from vermin and ill weather we look for many of the most perfectly conditioned show birds to come out of these June hatched broods.

FRANKLANE L. SEWELL.

JUNE HATCHED BIRDS FOR WINTER SHOWS.

The Season Naturally Favorable to Growth—Free Range for Hens with Chicks—A Shaded Location for Coops and Brooders—Green Food and Clean Water Important.

By H. A. Nourse.

JUNE is a month of growth if most is made of the favorable conditions usually prevailing and chicks hatched this month will often make bone and muscle faster than those of earlier hatches. This is especially true when the owner is without facilities for properly housing the chicks during the chilling storms which April and May some times furnish. In June not much protection is necessary. The brood may be out in the fields where the requisition of fresh air, exercise and green grass will build strong bodies, able to take care of all the food that the chicks can eat. No conditions are more favorable for securing good growth at the least expense for labor and food.

Some of the winners at the largest shows in recent years were hatched in June. In the Plymouth Rock, Wyandotte and Leghorn classes June hatched birds are frequently awarded the ribbons and a successful breeder of Buff Cochins, asserts that some of the best January show pullets he ever raised were hatched in June and July.

Chicks With Hens.

The man who broods his chicks with hens, and has a range of fair area, can make the most of his chances by confining the hen to the coop only at night and in bad weather. At other times she should be out with the chicks teaching them to find the natural food intended for them and protecting them from their natural enemies. Such a course not only strengthens them physically, but makes them self-reliant and able to take good care of themselves when they are deserted by the hen. This freedom also allows the hen to dust frequently in the cool, moist earth, keeping her feathers clean and assisting to rid herself of lice, which increase faster in warm weather and must be kept down. To this end, hen and chicks must be treated for body lice and head lice. If the hen is confined most of the time, a roomy coop and good ventilation should be furnished. In warm weather coops should be located in the shade, or if this is impossible, they should face toward the north. If the hen is free she will find a cool place, but if confined, she is likely to suffer from the heat and the chicks remaining near her while young, will suffer also and fail to prosper.

Brooder Chicks.

Chicks in brooders are supposed to be, and should be, free from lice. No chick that has had a chance to get a louse on it should be put in the brooders or in a brooder house and, if that is looked to, brooder chicks have an advantage over chicks with hens. Most of the June brooder chicks are housed in outdoor brooders and the shade question becomes one of major importance. A brooder placed in the sun, however well it may be ventilated, will reach a high temperature during a hot day and cool rapidly at night, making it necessary to extinguish the lamp during the day and start it again at nightfall. This does no particular harm if the chicks are old enough to take care of themselves and can find shade during the day; but it is unfortunate for little chicks as the temperature will vary widely.

Under a group of shade trees or in an orchard is the best place for a brooder at this season, the shade tempering the heat of the sun. If the cover of the brooder is raised, there will be no difficulty in keeping the heat under the hover within bounds. To place a brooder where it will be exposed to the midday sun and confine the chicks in a small yard also without protection is nothing less than cruelty, and good results are impossible.

Feeding and Watering.

The feeding of June chicks need not be different from that advocated for those hatched earlier. The green food should be young, tender blades of grass gathered by the chicks themselves; if the young ones must be confined to yards, fine lawn clippings or the delicate leaves and stalks of new clover, rape or alfalfa should be handed out liberally every morning while they are still fresh from the night's dew. Cool, fresh water constantly accessible is a decided advantage and far more difficult to provide than in cool weather. The supply should be renewed with fresh water three times each day and the fountains cleaned and disinfected frequently, for germs multiply rapidly in tepid water. The need of being thus careful is obvious when we understand that the germs of diseases affecting the lungs, throat and head find drinking water a ready means for distribution. Prevention is not difficult and is better than cure. Take care of the June chicks and they will take care of you.

H. A. NOURSE.

JUNE HATCHED CHICKS.

Leading Breeders Give Their Experiences With Late Hatched Chicks—Evidence That With Care and Correct Treatment Chicks Hatched in June Make Winners in December, January and February.

[The following short articles from experienced and well known breeders will encourage those who, from any cause, do not have as many early chicks on hand as they need and instruct beginners in the care and feeding of late hatched chicks. By studying the methods advocated by the best authorities the reader can readily determine how to make the most of the natural advantages within his reach and how to avoid the mistakes that spoil the profits. Opinion among these experienced breeders is practically unanimous that food, water, shade and lice are the main considerations, and that with the exercise of care in raising the birds many a June hatched chick will win fame for its owner at next winter's shows.]

RAISED UNDER SUITABLE CONDITIONS, JUNE HATCHED CHICKS ARE UP TO WEIGHT FOR WINTER SHOWS.

WHILE IT is true that early chicks do better, still a great many good birds can be, with proper care and feeding, raised from chicks hatched in that month. We have had June Barred Rock pullets laying in January and February, and continue laying until late in the spring before becoming broody. The cull cockerels can be sold early in the fall, when they make excellent fries. The others should be separated, cockerels from pullets, put in light, dry, warm coops, and kept for the spring trade. They must be made to scratch for their grain, and positively must have grit, green food and a dust box to insure steady growth through the winter.

One of the greatest difficulties in raising June chicks is the extreme heat. Shade and plenty of fresh water are indispensable. An orchard or a berry patch makes excellent shade, or rape seed sown early in May makes good shade, and green food, too. Sometimes on the lawn we drive stakes in the ground forming a square, and fasten burlap to them, making a shelter about two feet high, which breaks the sun, but allows a free circulation of air.

Our chicks are free to roam at all times. We do not think the wet grass, early in the morning, hurts them in the least, but rather believe it toughens them and speeds their growth.

We feed rolled oats and whole wheat; it makes bone and muscle and they thrive on it. They get but little corn. Feed June chicks sparingly during the hot months of July and August, keep them a little hungry and they will forage better, eat more grass and green stuff, find more bugs and worms, and you won't know what a sick chick looks like. You can force their growth more when the cool nights of September come by giving them all they want to eat for supper of a good mash food, composed principally of bran, shorts and chop feed, with a handful of salt occasionally.

We use open front, shed roof coops, without any floor, about four by six feet on the ground, which can be easily moved, thus keeping them clean and wholesome. If the chicks want to roost on the ridge, or on a brush heap, or in the trees, we let them; it makes them tough. Keep them as near natural conditions as possible and a great many June chicks will be up to weight for the winter shows and for winter layers.

W. S. PEASE.

CARE, CLEANLINESS AND VARIED FOODS CAUSE CHICKS HATCHED IN JUNE TO WIN IN DECEMBER, JANUARY AND FEBRUARY.

I will give you my views on the raising of June hatched chicks for exhibition purposes.

Chicks hatched before June 15th can be virtually matured by January 1st following, by close attention to feeding, wide range and sanitary, well ventilated cooping. Food for first two weeks should be given every two or three hours, dry mixed cracked grains, hulled oats, wheat, millet and corn. Fresh milk twice daily and pure water and grit at all times. After the second week and up to four weeks of age a little chopped fresh meat daily. When one month old allow free range, shaded. Provide a dusting box made up of equal parts of fine lake sand and road dust, with a little powdered sulphur added, and place where it will keep dry. This will keep them free from lice.

Do not crowd the roosting coop. Young chickens must have plenty of room in order to thrive.

Separate the cockerels from pullets at fourteen weeks.

Have your winter quarters ready by October 25th. After this time provide fresh ground bone and vegetables daily in addition to the oats, wheat and corn. Clean, well ventilated houses are particularly essential. I remove the droppings daily.

Chicks raised in this manner will be ready for the December shows and will be of standard weight. The first prize White Wyandotte Cleveland cockerel, December, 1902, was hatched June 10th. A full brother hatched the same date headed the second prize pen at Pittsburg show in February, 1903. At the Painesville show in January, 1904, the pullets I exhibited in the first prize pen were hatched the first week in June, and all were standard weight or over.

So do not be discouraged over the late spring and delayed hatches, but redouble your care and you will be up in front when the winter show season arrives.

DR. WM. H. HUMISTON.

JUNE SAID TO BE "ONE OF THE BEST" MONTHS FOR HATCHING WINTER SHOW BIRDS.

As a matter of fact I have always considered June a splendid month to get out "Ringlet" Barred Rocks and have hatched a great many winning show birds as late as July. Every bird in one of my New York first prize exhibition pens was hatched in July. Some of my first prize pullets at New York were hatched August 10th.

Birds hatched in June are ready to show in January and

July chicks, if well cared for, are ready to show in January and February. I have had July pullets lay in January. Many breeders calculate to get out their January and February show birds in June so the birds will be "on edge" or in the pink of condition at show time and not be past their beauty period.

I care for June hatched chickens just the same as those of any of the spring and summer months. My chicks have all the shade they want as well as sunshine, and sunshine is as necessary as shade.

While I do not say June is the best month to hatch in, I know that it is one of the best and I get out several hundred "Ringlets" every June and have done so for years.

I feed chicks the same in June and July as in April and May.

E. B. THOMPSON.

JUNE HATCHED CHICKS REACH MATURITY EARLY ENOUGH TO LAY WHEN PRICES OF EGGS ARE AT THEIR HEIGHT.

Chicks hatched in June can be made profitable both as layers and show birds, if raised under conditions to promote a healthy growth. Their treatment differs but little from that which is given the early ones; the difference can be summed up in a few words, namely, plenty of shade and cool, clean water to drink at all times.

Up to four years ago I shared in the belief that late hatched chicks were undesirable, but after giving the matter a thorough test I find that White Wyandotte pullets hatched in June reach laying maturity in less time than the early hatched ones, and many experienced breeders are of the same opinion.

Our late chicks are fed the same as the early ones up to a certain age, then they are fed differently. A prepared chick food is fed until they are six weeks old, three times a day the first week and five times a day up to the seventh week. They are then changed gradually to hulled oats, whole wheat and cracked corn. This is fed four times a day. Several boxes containing ground oats, bran and beef scraps (equal parts) are placed at different points on the range and from these they help themselves at will. It is astonishing the amount of this mixture they will consume between their regular meals. Being housed on a good grass range, they have all the green food needed. About the middle of September I begin to feed a mash to the pullets, and this is where the difference in feeding occurs, the late pullets being fed this mash at an earlier age than the early ones, for at this season all are fed alike. The mash is composed as follows: Ground oats 50 per cent, bran 25 per cent, middlings 15 per cent, corn meal 10 per cent. It is mixed with boiling water at noon and left to cook in its own heat until 5 p. m., when it is cool enough to feed. It is fed in several long troughs so that every pullet has its share. No crowding at this meal is allowed, and the whole grain is scattered so well that crowding is not necessary; all get their share.

Pullets hatched June 20th and treated as above began laying December 27th and were persistent layers for months. If I were forced to delay hatching till June I would follow the above method and have eggs for market when prices are highest.

Many of our best layers were hatched in June, and I shall never again hesitate to hatch chicks in that month.

The greatest objections to raising late hatched chicks are lack of shade, improper attention to drinking vessels and crowding one hundred chicks where only fifty should be quartered, but these objections are easily overcome, and where they are, June hatched chicks are profitable.

C. BRICAULT, M. D. V.

SATISFACTORY EGG PRODUCTION BY JUNE HATCHED CHICKS.

Year after year we generally have more or less chicks come off in June. This year, owing to the long and severe winter and backward spring, we expect to hatch between 200 and 300 during that month. The main object with us is eggs. We want pullets to lay early and lay lots of eggs. We have, in most cases, found June hatched chicks profitable; the pullets especially. June hatched White Wyandotte pullets have begun to lay with us in October or November, just before cold weather, and have continued to lay all winter.

We place the brooders, or hens with chicks, in a cool, shady place under the trees and arrange the yards in such



Where Chicks Grow Rapidly on the Plant of Mrs. H. W. Hand.

a fashion that the chicks may have a little sunshine.

Our method of feeding late hatched chicks does not vary very much from that pursued in feeding earlier chicks; the only difference being that we increase the beef scraps a little after the chicks are four or five weeks old.

We have tried in the past the dry feeding method for small chicks, but have given it up for the mash and dry grain combination. We can in this way get our birds to mature quicker and lay earlier, without affecting their size. We are using this spring one of the widely advertised chick foods, twice a day, with cracked wheat, hominy grits, pin head oatmeal and a little cracked corn. These small grains are fed dry three times a day for the first week and twice a day for the second and third weeks. After that time we begin to feed a little hulled oats and whole wheat and a little cracked corn once a day. We have lost less chicks this year, up to the present time, than we ever did before when dry food was used exclusively.

We are careful in raising late hatched chicks to give the little fellows plenty of shade, good pure drinking water and to keep them free from lice. Our chicks when old enough to leave the brooders have the range of a meadow and a piece of woodland, where they have plenty of shade. We use colony houses 6x8 with shed roof, and four feet high at the back and seven feet in front, with door and window, which are replaced through the summer by screens.

HAITZ POULTRY FARM.

LICE, FOUL RUNS AND WANT OF FRESH AIR THE MAIN OBSTACLES TO SUCCESS WITH JUNE HATCHED CHICKS.

Some people claim that June hatched chicks do not grow as quickly as those which are hatched earlier. The reason, perhaps, is that the millions of lice and mites that have been incubating and brooding through rain and shine of the early spring are not kept in check when the warm weather comes. For this pest the Iowa Agricultural Experiment Station recommends coal oil emulsion.

The next disadvantage is a swarm of chicks have preceded the late hatch, the runs are befouled by the earlier chicks and the old fowls, and the little fellows suffer for pure air day and night and are tramped on and crowded to death. Besides this the weeds, berries, etc., claim our attention and the late chicks are not as well cared for as the earlier ones.

Nature teaches and my experience proves that May and June are the months to hatch birds, and with the same care they should do as well or better than the earlier birds, for insect food is more plentiful and sunshine more abundant; but now we must provide shelter from the hot sun instead of from cold winds; also good, roomy, well ventilated coops or brooders.

If brooders are used they must be constructed so that the chicks can have free access to heat or fresh air as they prefer. Both coops and brooders must have at least one side made of screen wire netting; a few holes in a box is not sufficient ventilation; a damp, perspiring chick turned out in the cold morning dew to chill might as well have its head snipped off at once. A chick can eat almost anything any time of year, if it is not over-heated or chilled, but a chilled chick will have bowel trouble and no brand of food will cure it.

MRS. S. P. ROGERS.

MUCH DEPENDS UPON THE CARE LATE HATCHED CHICKS RECEIVE.

I have had good results with last of May and early June hatches. For late December and January shows there is no better time to get them out than May 25th to June 15th, as they mature after the weather becomes cool, and the plumage is bright at show time. My winners, both cockerels and pullets, at the late Peoria, Ill., show and at late Illinois State Show, all up to weight, were hatched from May 25th to June 10th. This is ample evidence that June hatched chicks will make show birds.



A Group of June Chicks Ready to be Fatted for Market.

Unless one is well fixed to handle these late ones I wouldn't advise getting out too many of them, but a few will prove what I am stating is true. The great trouble in handling late hatched chicks by many is they lose interest in them. Early in the spring the hen fever is up to 95 or higher, but it gradually cools off as the weather gets warm and the chicks are neglected.

I would brood at that time with a hen. Place coop, which should be of sufficient size to give ample room and fresh air through the hot nights, in a dense shade—a large apple tree or north side of a building is the best for June hatched chicks. Feed mostly dry food at this time. Provide fresh water often, and after chicks are a few days old give the hen her liberty, and all the chicks have to do is to grow.

I have for several years raised a few late hatched birds, even as late as July 1st. This season I will be compelled to get out even more than usual owing to the lateness of the spring and the immense early egg trade.

To those who are prejudiced against late hatched chicks I will say that a sitting or two of eggs at this time will prove that what I am saying is true, provided you do your part in caring for them.

O. L. KING.

ADVOCATING JUNE HATCHED CHICKS OF THE LIGHTER BREEDS FOR WINTER SHOWS.

I have hatched many S. C. White Leghorns in June with great success for both market and exhibition. I have raised many winners of both sexes which were hatched in June and won in December. They were fully developed and weighed from four to six pounds, and as all Leghorn breeders know, that is good weight for them.

I always feed young chickens for the first five weeks with prepared chick food. Have used this for several years. I have not known of a single case of bowel trouble in feeding this food. After the chicks are four or five weeks old I commence feeding them cracked corn and wheat; keep fresh water before them all the while, also oyster shell and grit.

One must have a good shelter for them and protect them from drafts which give them colds. Do not crowd and over-heat them; this will affect their health. Give them just enough food so they will eat it up clean and not have any left. Keep the vermin down. I use lice killing powder on the chickens, and kerosene on the roosts.

It never pays to half raise a chicken or any kind of an animal.

If I were starting in the poultry business and were delayed in getting eggs on account of the cold spring, that would not prevent me getting eggs in June. I would get some eggs from some reliable breeder who has the breed I like best. Everybody has his favorite breed. After the chickens were hatched I would do my utmost to feed them right and keep them free from lice and colds. When fall arrived I would have a fine lot of choice chickens, especially if of the lighter breeds, which will mature in four and one-half to six months and commence laying in five or six months and lay about two hundred eggs per year on about one-half the feed that it takes for a larger breed.

R. C. COLLIN.

HAS NO EXTRA TROUBLE RAISING JUNE CHICKS.

I will give you my method in hatching and raising June chickens. I give the hen a nest free from chiggers, lice, and mites, and set her where no laying hens can bother her.

I keep the eggs and nest clean. When the chicks are hatching I take the shells out of the nest to give the chicks room. I leave the chicks in the nest twenty-four hours to give them strength.

Chicks don't need food for thirty-six hours after hatching. The first food is oatmeal, dry, mixed with fine grit or prepared chick feed. Give them cold water and very little at a time when young. Take the hen and chicks off the nest and put them under a good shade tree. Make a coop for hen and chicks two feet long, eighteen inches wide, twelve inches high. Don't nail the top—leave it loose so you can look in at the chicks from the top. Make a slat coop four feet long, two and one-half feet wide and fifteen inches high to put in front of the coop. Let the hen and chicks out in the slat coop so the chicks can run around. Keep the hen in the slat coop for a week, until the chicks get strong and learn the hen's cluck. Let the hen and chicks run out over the farm to hunt bugs and other insects. The exercise makes them strong, and gives plenty of muscle. Feed June chicks by themselves. I don't have any more trouble raising June chicks than I do raising April hatched chicks.

JOHN W. TANNER.

PUT THE LATE HATCHED CHICKS IN A CORNFIELD AND RAISE THE BEST COLORED BIRDS OF THE SEASON.

I have often wondered why there were not more eggs set and chicks hatched during the month of June. To be sure it takes some precaution to successfully rear chicks hatched in the months of June and July, but not nearly so much trouble and expense as is needed in the months of January and February. To readers of this book who have no brooder houses I will give you my plan for successfully rearing late hatched chicks. Supposing you are aware of the fact that you must not take the chicks off the nest or out of the incubator until fully forty-eight hours old, it is unnecessary to go over that part of my method. If you have a small poultry house or an outhouse where rats cannot get at the chicks place the brood in this building, keeping them in it for three or four weeks. This gives the chicks size and strength enough to withstand the hot sun and small grass lice. When you move them from the building put them, if possible, in a shady place. If you can do so, by all means place them in a cornfield, for there is no place where a late hatched chick will grow as fast as in a field of corn well up, as it affords them plenty of shade, keeps them off the dewey grass and the fresh cultivated ground gives them plenty of insects, worms, etc.

I feed my chicks while in the brooder, or say for the first six weeks, a chick food composed of wheat, kaffir corn, hog millet and rice, mixed and cracked, the greater portion of the food being wheat. To this I add a little pin head oats (very little), hard boiled eggs, some green cut bone, etc. Keep granulated charcoal by them all the time, as well as fresh water. Do not feed too much, but often.

Make the little fellows work all you can. After you take them from the building they will find plenty to do and require little food. After they are six weeks old change the food to a mixture of rolled oats, cracked corn and whole wheat, feeding three times a day, or better yet, hopper feeding, which I believe to be the best way to feed chicks from six weeks of age until matured. The White Rock cockerel which won first at Chicago and for which I refused \$400 was a June hatched chick.

There is no use arguing the question, the best colored specimens in nearly all breeds are late hatched chicks. The

difference in caring for late hatched chicks and early hatched ones is in keeping one cool and the others warm.

U. R. FISHEL.



A Shaded Yard for Growing Chicks.

INSECT LIFE SURROUNDS THE JUNE HATCHED CHICK WITH DELICACIES ITS EARLIER HATCHED RELATIVE CANNOT ENJOY, AND HELPS TO MAKE IT A WINNER.

To all those interested we most heartily commend the June hatched chicks, for various reasons.

Many people think, and especially amateurs, that they must hatch a chick in February or March if they wish to get a prize winner, but with our experience nothing is farther from the truth. A truly healthy chicken and one that can successfully combat the pests and diseases that afflict it must start on the voyage of life with all conditions as favorable as possible, and there is nothing so conducive to vigorous growth and good health as warm sunshine; the sun's rays also have a wonderful influence in bringing out and beautifying the plumage, especially in a two or more colored fowl. Another advantage that the June hatched chick has, and one of very material worth to him, is the warmth coming from mother earth at that time of the year. Warm feet are a great incentive to rapid growth, but the greatest blessing that can probably come to this bird in his race for maturity with his older brother is his opportunity to prey on insect life in his pillage for food. From the very first day that he emerges from the place of his birth to comfortable quarters on some grassy plot he begins to enjoy his existence in the warm sunshine and to prey on the little worms, spiders and flies, and as he grows older and larger and his courage comes to him he becomes a bold hunter and wanders farther from home, making conquests on larger game, like the cricket, and eventually as his strength and endurance come to him he is able to capture that greatest of delicacies to the chicken appetite, the grasshopper. These advantages the earlier hatched bird does not have. At the time of his advent into the world, in March or April, when the atmosphere is usually damp, and there are more or less cold winds and a great deal of cloudy weather; consequently the chicken hatched at that time of the year has to be sheltered, carefully fed and supplied with artificial heat, which except in brooders cannot be kept at an even temperature. These difficulties make the raising of early chicks not only very troublesome, but also very expensive.

One of the greatest obstacles, perhaps, in raising late hatched chicks comes in the extremely hot and dry weather

of August and September. The birds raise themselves, so to speak, so easily up to this time that breeders are apt to become careless and allow their shelter to become foul, and a coop that was plenty large enough six weeks before is wholly inadequate now, and they crowd and pack themselves together during hot and sultry nights until some are smothered, and mites and lice kill many more.

We receive some inquiries asking if one is unable to produce a prize winner from chicks hatched in June. To such we tell what we have noticed by observation and personal experience. That some of our best show birds have been late hatched, and it is the personal experience of one member of this firm, who is also interested in the firm of J. M. Williams & Co., that the Buff Orpington cockerel that won first at Chicago in 1902 was hatched in July and weighed eight and one-half pounds in the show room in January.

These facts, together with others we might cite, if time and space would allow, prove to our own satisfaction that June hatched chicks are just as profitable to raise as those hatched earlier, for every purpose except broiler raising.

FILLIO, WILLIAMS & CO.

A CAUTION TO WATCH FOR LICE AND GIVE THE CHICKS RANGE, AND SO MAKE WINNERS OF THE JUNE HATCHED BIRDS.

Where most people have trouble in raising June hatched chicks is in letting the hen run loose as soon as she gets through hatching and sometimes neither she nor the chicks have shelter. The little chicks should have a dry place to sleep. Those who do not watch for lice find this a great drawback to the June hatched chicks. You should look at your chicks about every four weeks and dust them. A June hatched chick should have plenty of that good free range.

There are prize winners hatched in June as well as in the earlier months. At Indianapolis in February two of the pullets in our first prize Buff Rock pen, also our third prize pullet, were hatched in June and there was not a larger boned pullet in the class than the third prize bird.

When we take the hen from the nest with her chicks or take them from the incubator we let them run out on a dry floor and give them a fine chick grit. In about twenty-four to thirty-six hours after we feed them a little chick food. Do not feed too much, but just keep them hungry. We feed the chick food for about four to six weeks and then we feed them wheat and cracked corn till they get large enough to swallow a whole grain of corn.

We have sold on the market in January chickens that were hatched in June. They weighed five to eight pounds each and have showed pullets that weighed from six to seven and one-half pounds and cockerels that weighed seven to eight and one-half pounds.

In raising late hatched chicks one of the main things is to get them started right and then keep them on the right road. I have given the method of feeding, but the main thing is to fight the lice and give them plenty of range; that is what makes them grow.

Lice will take the strength from the chicks and often will kill them and people say it was the cholera when it is nothing but the lice. Sometimes too many chickens are crowded in one house and this will give them colds and stop their growth.

If I was starting in the poultry business the month of June would suit me just as well if not better than the other months. I find the Buff Rock chicks have a better color in June, better wings and tails than the earlier chicks and if you watch the lice and give them plenty of range they will

get as large as the early hatched ones. If you are feeding a drove of hogs let them run with them and they will get the size and will have that large bone we want.

W. REESE PAETZEL.

PROOFS THAT CORRECT CARE AND FEEDING DEVELOP JUNE HATCHED CHICKS INTO WINNERS AND WEIGHTY SPECIMENS.

In regard to late hatched chicks, especially those hatched in June: are they profitable? I say most emphatically: Yes! Such birds make good winter layers, especially the Wyandottes, and (barring the early fall shows) make excellent exhibition specimens.

Partridge Wyandotte pullets commence to lay when about six months old, and it is generally conceded that such birds as a rule are in their best condition to show just after having laid their first egg; therefore a pullet hatched the 20th day of June should commence to lay about the 20th day of December, at which time she should be in the best condition. The majority of our largest shows are held during the months of December and January, and late hatched birds have an equal chance of winning in competition with many of those which were hatched much earlier.

One season I hatched chicks as late as the first day of August with good results; and it may be of interest to many to know that some of the very best cockerels and pullets that I raised were hatched the 20th day of July, among them being the first prize pullet at North Abington, which show was held the 25th day of December. The same pullet also took third prize at Madison Square Garden, New York, January 5th, and another of the same age and in fact out of the same brood took fifth prize at that show. It will be seen that the pullet which won first at North Abington was just five months and five days old when exhibited, and the two when shown at the New York show were just five and one-half months old. These two birds were exactly standard weight when shipped to the New York show, and the third prize pullet had laid her first egg. The fifth prize pullet then had many chicken feathers and was not filled out and finished, but was penciled all over with good open penciling and gave promise of developing into one of the most beautiful birds that I ever raised. The manner in which this bird developed during the following month was something surprising, and had she been hatched June 20th instead of July 20th, she would in all probability have been placed much higher at that show. She is to-day one of my most valuable specimens and lays a large, brown, well-shaped egg.

I have seventeen pullets that were hatched last July, that are up in weight and all are high scoring birds, and as hens some of them will in all probability be a trifle over weight next fall when in show condition, which rather discounts the idea of many that late hatched birds are always small and stunted.

One of the first questions naturally asked is, How were these birds fed?

For the first three weeks they were fed entirely upon a chick food, which was fed to them every two hours; for the next three months they were fed upon prepared chick food, beef scraps and what little scraps I had to give them that came from the kitchen. During this period they were fed four times a day. After they were four months old they were given a mash in the morning consisting of chick food and beef scraps mixed; at noon they were given oats and wheat, and at night they were given wheat and cracked corn; besides this they were often given cabbage, lettuce

and dainty bits of anything that I was able to get which I thought would induce them to grow.

There are many reasons why we should recommend the setting of eggs all through the month of June, and especially to those who are just starting in the business of raising poultry. My experience has been that during the month of June eggs as a rule are very fertile, and a large percentage of them hatch, in many instances, every egg put under a hen. Weather conditions during this time of the year are generally such that both eggs and chicks will stand more hardship and neglect than is the case during the early hatching season. Fanciers (myself among them) who advertise to replace all infertile eggs occasionally have to replace many that were shipped during the early part of the season, even when we know by repeated tests that at least 85 per cent of them were fertile. Such conditions prove to my mind that the manner and place where eggs are set (especially early ones) and the way hens sit upon them, or the manner in which they may be manipulated in an incubator, combined with weather conditions, cause many poor hatches, which not only is a loss to the fancier to the extent of the infertile eggs returned, but often discourages customers who have had but little, if any, experience in the business. If an equal number of eggs had been ordered later in the season a greater number of chicks would have been hatched and both parties would have been better satisfied.

It is also claimed that a larger per cent of late hatched chicks are pullets, which is desirable to most purchasers.

The main question to be considered in raising late hatched chicks is to get them far enough advanced before



Movable House to Serve as a Roosting Coop or to Protect Small Chicks in Bad Weather.

the cold weather sets in, that they will not be stunted thereby. I have proved to my own satisfaction that it can be done, and birds raised to full standard weight from eggs that were set the last days of June. J. B. HADAWAY.

FEEDING YOUNG CHICKENS.

Dry Feeding and Unlimited Range. Make Large, Healthy Chicks.

By C. B. Bristol.

I HATCH all chicks with hens, but as soon as they are hatched I take them from the hens and put them in brooders, which I believe is the only way to rear chicks satisfactorily. You have them where you can watch them at all times. I use indoor brooders and believe them to be far superior to outdoor machines that are used without shelter. The outdoor brooder works well and is fairly convenient to use when the weather is fair, but when it is stormy, or there is a high wind, it is neither convenient nor agreeable to attend to the lamp. When it rains hard, it is almost impossible to open and clean the brooder and the chicks suffer from being confined in very small quarters and from breathing the impure air of a dirty brooder.

If the brooder is in a building, the chicks can have the run of the floor, when the weather is not fit for them to be outside. An open shed built over an outdoor brooder for shade and protection from rain and heavy winds is considerable advantage, for it protects one when he fills and trims the lamp, or adjusts the flame, and when he feeds and cares for the chicks. If such a shed is provided with a muslin curtain to be let down in front when the weather requires it, it makes a good exercising room for the chicks, when they would otherwise have to be confined in the brooder.

I do not feed anything until the chicks are twenty-four hours old; then I feed hard boiled eggs. For the first week I feed corn meal bread that is baked until it will crumble. This I feed as often as they eat it up clean. After the first week I feed cracker crumbs and stale bread which can be purchased of bakers very cheaply. As soon as the chicks will eat whole wheat and cracked corn I feed it. I also feed beef scraps twice a week, and keep plenty of grit in the brooder. This is very necessary, as it aids digestion.

I am aware that some poultrymen, who have reason to know, advise against the use of hard boiled eggs, but I have never found anything equal to it for the first meal. The corn bread is an excellent food, but must not be depended upon after the first week, because it is too much trouble to bake it and because it is not by any means a complete and well balanced ration.

I keep the chicks in the brooder until they are a week old before I let them out in the brooder house. After they are four weeks old I have small coops, which are set in different parts of the place, so they will be by themselves, and all of the same age then are together. The smaller ones are not crowded by the larger ones.

This is a point worth noting and acting upon, for if small chicks crowd into the same coop with larger ones, the former are frequently overheated at night and prevented from getting their fair share of food in the day time. This prevents growth and arrests development, and the chick never makes so good a fowl as it would if it had a better chance. Those of one age should be fed separate from the other flocks, or the younger ones will be crowded away from the food by their larger brothers, and will not get enough to properly nourish their bodies.

My chicks have unlimited range at all times. I breed Barred Plymouth Rocks and the above mode of feeding and caring for them has been very satisfactory to me, as I hardly ever have a sick chicken and I have pullets hatched late last year that weigh eight pounds. I feed grain entirely to all my fowls, and no ground feed except cracked corn. My first hatch this season, the 15th of March, was ten chicks from thirteen eggs; from eggs laid in February, the coldest month we had this year. C. B. BRISTOL.

FEEDING CHICKENS BALANCED RATIONS.

From Hatching Time to Maturity—Suitable Foods and Quantities for the Different Periods of Growth—Feeding the Newly Hatched Chick—Balancing the Rations—Ration for Growthy Youngsters—Forcing Late Hatched Chicks for Show—Analysis of Food in Common Use by Poultrymen.

By Robert H. Essex.

CHICKENS need a far narrower ration than do matured fowls—a ration containing considerable animal food, and this is one of the points I wish to impress upon readers. Experience has caused me to realize its importance. In the early days of Buff Plymouth Rocks, their combs were too large, and knowing that meat, even in small quantities, tended to increase the size of the combs, I avoided its use as much as possible. By this course the size of the combs was governed to a certain extent, but what a difference was visible in the growth of the young birds which were supplied with animal food and those which were deprived of it. We all like to experiment, and it took me a few years to find out that not only do chicks need animal food, but they need it in liberal quantities. It has long been demonstrated that some meat is necessary, but in the case of young chicks it is not generally fed in sufficient quantities.

Feeding the Newly Hatched Chicks.

Study nature. Wild birds in feeding their young have preferences, even in the selection of vegetable foods. Some prefer weed seeds, others the young buds of trees; many are partial to fruit and other vegetables, but a very large majority gather in the flies, bugs, beetles and worms that venture within their range, and upon these the young warblers thrive, grow fat and feathers, and are in a very short time in show condition. Have you ever noticed the quills on the nestlings? How fast they grow. Seldom do we see a chick feather so fast. The food that produces feathers rapidly is the best food for chickens, and they should be well supplied with it, at least until they are through their first molt. Such food will be chiefly animal food and will compose a very narrow ration.

It is well known that the yolk of the egg is absorbed by the chick before and after hatching. That is nature's food and must be good. Is it a wide or narrow ration? It is extremely narrow. One part protein to three parts fat is considered very narrow, but this first food of a chicken is even more so. It is composed of one part protein to about two parts fat (15.7:33.3), and please remember it is about

one-half water—one-half water. Milk is another natural food for the young, and just as good for chickens as for babes. How is it proportioned—3.3 protein to 4 fat. Add the starchy contents, and approximately it reaches the proportion of 1:2. Quite narrow, is it not? Yet the young live and thrive upon it.

Nature teaches us, therefore, that the food of young chickens should contain about one part protein to two parts carbohydrates and fat. This is from two to three parts narrower than is generally advocated, but it has given better results than any other I have tried and my experiments have been not a few. Then, too, as we have shown nature upholds it.

Do not feed hard boiled eggs in large quantities. Such food may be balanced correctly, but it is indigestible for the very young chicks, and remember that of all foods only the portion digested provides nutriment. If you must feed it, let it be well broken. Let the particles be thoroughly separated by the use of stale bread crumbs, then nearly the whole of it will be digested. It is far better, however, to use uncooked eggs. Mix them with bread crumbs, shorts, cornmeal or all of these, so that the food shall not be sticky or pasty. Use some bran if you choose, but not too much, and if you are tempted to add a little clear sand, don't be timid about it. The shorts or middlings may be found too sticky; bread crumbs are best for the purpose and if you have only a few chicks it will be well to separate the yolk from the white of egg, using only the former and so avoid mixing too much at a time. This refers, of course, to the first week. After that the chicks will take care of it all. Steel cut or granulated oats make a good food for the second week, also millet seed.

As the chicks become older—say from two weeks of age, beef scraps, dried blood, animal meal or fine ground green bone may be used with benefit. These foods contain in large proportion the protein we want, and their use enables the feeder to make a ration suitable for chicks. Care must be taken that too much of this is not fed at first. Some of these foods are too strong for young chicks, and I use them at this age only when I can't get fresh meat—liver, etc., etc.

Without the aid of beef scraps or one of the other animal foods mentioned the eastern duck growers would never have been able to place ducklings upon the market in such desirable condition as they do. Their growth would not be so fast, their flesh would be less tender and the ducklings less plump. This means that demand would decrease and prices would be lower. Just so with young chickens. If intended for market as broilers they must have animal food to hasten growth and keep them in health. The forcing to which they are subject would run them off their legs in a short time if their food consisted exclusively of grain either whole or ground. A most desirable feature of these animal foods is that their protein contents produce flesh without an excess of fat. The breeder of exhibition stock will appreciate the importance of this fact, especially if the cockerels which he has been forcing for early fall shows give signs of leg weakness. The food they have been getting



"A" Coops and Runways for Young Chicks.

has produced too much fat and not enough muscle and flesh. A change of food—the addition of animal protein to the ration—goes to the root of the trouble and in a short time the birds are again “on their feet.”

Animal protein works wonders with fowls, and while it is so plentiful in green bone, dried blood, animal meal and beef scraps, etc., and considering that these foods are so easily obtainable, no breeder of fowls can afford to be without a supply. In animal meal and beef scraps there is nearly as much protein as there are carbohydrates and fat. In green bone there is about half as much, and in dried blood there is little else than protein.

How chickens delight in a little crisp lettuce, grass or clover. Provide it if possible; otherwise cook some carrots, cabbage, turnips, beets or mangels for them, or let them pick away at the raw roots, or a few raw potatoes. Clover is now sold in such convenient forms (both cut and ground) that no breeder should be without it if he has any difficulty in providing green food. Lettuce and clover contain a large proportion of protein.

Let your chicks have enough food, but do not stuff them. Little chicks will begin to cry for you when they discover that you are their attendant, and if you are at all soft hearted it will be hard to refuse the continued stuffing they cry for. Feed little and often. Chicks are never so happy as when scratching in shallow litter for little crumbs or seeds. Will they do this if overfed? No. Limit the food and keep them singing, but let them have enough to repay them for their work.

Some breeders keep one variety of food continually before their chicks and a number of them are successful poultry raisers. This seems contradictory following immediately after the suggestion to feed little and often, but it is not so strange as it appears at first glance. If one kind of food is kept continually before them, the chicks partake of it only occasionally as they need it. If they have been fed on the plan first suggested—little and often, it is likely they will gorge themselves when first allowed access to large quantities of food, but if they have been used to it, they simply nibble and run, and although their crops are never empty, neither are they overloaded. If such a method be adopted the food to be kept before them must always be of the same variety. Cracked corn is generally used. A change from corn to wheat would be an inducement to overfeed. It would tempt their appetites and induce them to overload their crops. We do not advocate this method of feeding, but if it is adopted, as it sometimes is for a time-saver, the other food supply should be made up largely of protein.

Balancing the Rations for Chicks.

The reader has now been duly impressed with the value of protein and its use in the ration, and we will give an example of balancing the ration so that anybody with any foods will know how to go about it.

Following along the lines of our argument the ration shall possess about one part protein to two parts carbohydrates and fat, and is intended for newly hatched chicks.

Our first chick food is egg, both white and yolk well beaten. In this the proportion of protein and carbohydrates is about equal.

This we mix with bread so as to render it comparatively dry. We will assume that we have a flock of chicks that require about a pound of dry matter each meal. Dry matter is the total bulk of food less water or moisture. In one pound of eggs, that is the edible portion, there is twenty-seven per cent of dry matter that is made up of thirteen per cent protein and twelve per cent fat, in addition to ash,

etc. In a pound of bread crumbs we find eighty-eight per cent of dry matter made up of eleven per cent protein, seventy-five per cent fat, etc. If we add the total amount of protein and fat contained in the eggs and bread, we find we have twenty-four parts protein and eighty-seven parts fat; that is, about three and a half times as much fat as protein, the actual figures being 3:6. The nutritive ratio of this mixture would be 1:3.6. To make the ration nar-



A Shelter That Can be Opened or Closed, as the Weather Requires.

rower we might reduce the bread crumbs to three-quarters of a pound, but that would make the mixture too “pasty.” We will therefore leave it as before and instead of securing the narrower ration by that means we feed in addition a little meat. Take beef scraps for instance. These on an average contain about ninety-three per cent dry matter, of which forty-five per cent is protein and forty-seven per cent is carbohydrates. The protein and carbohydrates being about equal it will need only a little beef scraps to bring the nutritive ratio down to 1:2, the ration we have suggested before as being a desirable one for chicks.

We do not advise the use of beef scraps at this early age, but having the analysis before us, we used it as an example. Fresh meat will analyze much the same, so far as protein contents are concerned, and should be used in preference. If a little more bread is necessary to mix with the egg, it may be used.

After the chickens are one or two weeks old the egg food will become scarcer or perhaps too expensive and it becomes necessary to have a substitute. We wish to make the change of food without making too great a change in the ratio. In looking around for a suitable food we think of cracked wheat. One pound of cracked wheat contains about eighty-nine per cent dry matter, of which .075 is protein and .700 carbohydrates. Once more we take beef scraps to be fed in conjunction with it. We have given the amount of protein and carbohydrates in beef scraps. Now add the total to that contained in wheat and we have .525 protein and 1.170 carbohydrates and fats. Dividing the latter by the former gives us a ratio of 1:2.2.

Finely cracked corn may be substituted for the wheat. In which case the following result would be attained:

	Dry Matter.	Protein.	Carbohydrates.
One pound corn	.89	.062	.752
One pound beef scraps	.93	.45	.47
		.512	1.222
Nutritive ratio.....			1:2.4.

By the time the chickens have been fed this way for another week we reduce the proportion of beef scraps to one-half, which, in connection with cracked wheat, gives us a nutritive ratio of 1:3.2. This is a very satisfactory ration until the chickens are three weeks old.

As far back as we can remember we have known eggs and bread crumbs to be a first food for cage birds and for chicks, and now having examined the composition of these articles of food, what does it prove? Simply that the "old woman's nonsense" of eggs and bread crumbs is scientifically and naturally correct and that, knowingly or unknowingly, our grandmothers have been following nature's way as closely as possible.

If it is not desirable to go to the trouble of figuring out a ration, the easier way is to choose from the list such a variety of foods as will give a ration near enough for general purposes. It should be remembered that the larger the proportion of carbohydrates and fat, the wider the ration. If you wish to make the ration narrower take a food that possesses little carbohydrates and fat; bran, for instance, is one of the best of foods, but too bulky and indigestible for use except with a more concentrated food.

In this connection we must warn the reader to use very little, if any, cottonseed meal. We have before informed readers that it is very indigestible. Linseed meal is more easily digested, but it, too, should be used sparingly.

Remember to give the chickens all the green food they need. There is nothing better for them than clover, lettuce or cabbage.

From the age of three weeks or a month to the age of two months, nearly any grain may be fed that is suitable in size; that is, anything except whole corn. I generally feed hulled oats, finely cracked corn, millet and wheat, the greater the variety the better. If the fowls are on a good sized range they will provide themselves with nearly enough animal food. At this period the basis of the ration is wheat. I feed as much wheat as all the other grains combined.

Ration for Growthy Youngsters.

Early hatched birds cause little worry, little trouble, and it is a pleasure to see them grow.

An extensive run where shade is available is desirable. A grass run, an alfalfa patch, a clover or cornfield are alike ideal poultry runs and provide an abundance of insects that coax the rangy youngsters to exercise while furnishing them with a substitute for meat. Chickens from two to five months old gain size and health under such conditions. If they are on a farm where range is unlimited they need only a little additional food morning and evening, the variety depending upon what the fields afford. Where the range is less extensive it provides fewer insects and little or no grain.

We will assume that green food is plentiful.

Of what then shall the ration consist? Such foods as promote the formation of muscle and bone,—that means size; flesh and fat—that means vigor.

What shall the foundation of the ration be now?

Oats.

"But oats are so seldom fed," you say, "particularly in sections where corn is plentifully grown."

Where oats have been tried they are seldom discarded. They are the best grain I know to put size on a fowl, and they have formed the foundation of my ration for growing stock for many years, and my strain is noted for its size.

To form feathers which are continually being renewed in fowls of this age we require more animal matter than can be secured on the range. It is better to give more rather than less at such a stage and a ration of about one part protein to four parts carbohydrates is none too narrow. It may

be composed of the following each day: One feed of oats, one feed of wheat and one of meat or cut bone and corn. For the purpose of forming the ration we will take one pound of each with exception of meat and corn, of which we give half pound each. More or less than these quantities may be used, depending upon the number of fowls to be fed, but the proportion will be the same.

Upon examination of the list of foods given herewith we find that in a pound of oats there is .092 protein and .532 carbohydrates and fat; in a pound of wheat .075 and .700 respectively; in a half pound of corn .035 and .392, and in a half pound of beef scraps .225 and .235 respectively. To illustrate, we will add these quantities:

	Protein.	Carbohydrates and Fats.
One pound oats	.092	.532
One pound wheat	.075	.700
One-half pound corn	.035	.392
One-half pound beef scraps.....	.225	.235
	.	.
	.427	1.859

Upon dividing the carbohydrates and fat by the protein we find the proportion of these important constituents to be one part protein to 4.35 parts carbohydrates and fat. This is a little wider than we intended, but it is near enough for all practical purposes, even if we did not consider the green food and insects secured in the run during the day. The addition of these will bring the ration down to the desired point.

The foods composing the ration will be changed frequently with the exception of the oats. We will use oats every day. Sometimes we may substitute buckwheat for wheat or corn, at other times barley, etc., etc. Occasionally we feed a mash in which we use considerable bran. This will assist in keeping the daily ration narrow even though we may feel it wise to give a feed of peas or barley or an extra supply of corn (these grains containing large proportions of carbohydrates and fat).

With the example and analysis of foods here given there will be no difficulty forming a ration from such foods as are plentiful. Prices vary, as we have said, and the variation should be accepted as a hint to change the food. The fowls will not object.

During the month immediately preceding a show the birds may be fed as suggested for late hatched chickens, but unless they are under weight there will be no necessity for feeding them after the usual evening meal, which is given before sundown.

Forcing Late Hatched Chicks for Show.

Both the fancier and the breeder of poultry for market are well on the way to successful feeding when they have realized that different foods produce different conditions and have decided to select such foods as will aid them in securing the condition desired. It is clear that a change of food is necessary when the chick merges from its babyhood, takes on a new suit of feathers and becomes a full-fledged youngster. Every poultryman we believe sees the necessity for a change of food at that period, but the majority are governed simply by the knowledge that the chicken is then equipped with better means of digestion and can do with less costly and more bulky food. True it is that in most cases the breeder desires rapid growth and generally provides, or at least intends to provide, that which will induce it. Is it not in addition necessary to consider what requirement the fowl is intended to fulfill? Take the exhibitor, for instance. His fowls are destined for the show rooms, yet this does not mean that they shall all be fed alike or in equal quantities. Some must be prepared for the early fall and winter shows; others for the later winter shows. If the exhibitor is blessed with

incubators to hatch early chicks, brooders to accommodate them, and experience that enables him to carry them healthily through the early spring when conditions are unnatural, then indeed he will feed his fall exhibits as he will his later show birds, because there is little or no necessity for forcing them; but if his chicks are late hatched, he must adopt heroic measures to "bring them along" if he would gain a place among the successful exhibitors. These late hatched, forced youngsters seldom attain the size of those which are fed for growth and vigor and allowed to develop size before putting on the gloss and finish for the show room.

What method of feeding is practiced to hurry these young candidates along?

A ration composed of animal matter supplemented by fat forming foods; and during the closing stage the addition of foods known to contain considerable oil. The first is intended to hasten maturity; the second to put on weight, and the third to put on the finishing touches—the gloss to the feathers. Bulky vegetable food is added to keep the digestive organs in good working order, and frequently condiments are given to coax the fowl to eat more and more of the concentrated food. Frequent change of food is necessary so that the fowl shall not go "off its feed." Few foods are too expensive to be procured at this season, for winning in the fall means sales for the winter shows.

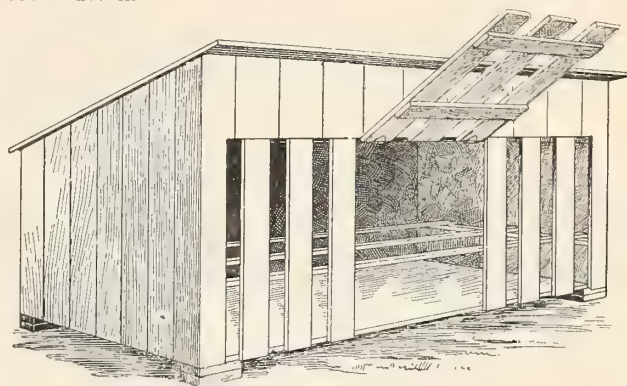
In the days when the writer was exhibiting—where the winters stole well into the spring and the big fall show seemed to advance to meet the summer—the principal event being held in August—many were the rations tried, and feeding sometimes extended well into the evening hours. "Little and often" was found to be a good motto, and only at the last meal (about 9 p. m.) were the fowls coaxed to eat more than they wanted, then they got the tempting tit-bits which had been saved for the last moment—scraps of meat, green cut bone, bits of bread, oatmeal porridge (well sugared), cooked rice, cooked potatoes—fed by lamplight.

Result: Winners at the fall shows; delicate birds later on.

These fowls were not allowed extensive range. They were confined in yards about eight by fifty feet, in flocks of eight or ten. Their roosting pens were kept scrupulously clean; wooden floors well sprinkled with sand every week, and droppings raked every day. They were confined to the house during inclement weather.

Tame? Sure! A little training in good sized coops built upon the walls above the roosts—handling every day—

given in place of the barley, wheat or oats, and during the two weeks preceding the show, hemp seed was provided, or linseed meal mixed with the mash. Cabbage was hung in the pens continually; grit of course always before them—sometimes put in their mash; and they had all the milk they could drink.



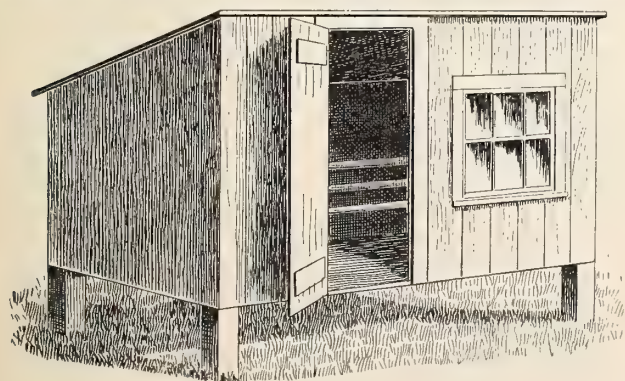
An Open Roosting Coop for Warm Weather.

We are enabled to present analyses of foods that have been made by experiment stations throughout the country. First it must be understood that analyses differ slightly because the foods analyzed differ in composition. It would be extremely difficult to procure two samples of wheat that contain exactly equal proportions of protein, carbohydrates and fat; similarly with regard to other vegetable formation. This applies also to animal matter. The quantities given therefore are usually average quantities, yet are sufficiently exact for practical purposes.

Proportion of Protein and Carbohydrates and Fat in Foods Used by Poultrymen.

	Digestible Matter in One Pound.				
	Total Dry Matter in lb.	Protein.	Carbohydrates & Fat.	Total.	Nutritive Ratio.
GRAINS:					
Wheat.....	.896	(.073)	(.700)	.775	(1:9.3)
Corn.....	.912	.070	.784	.854	1:11.2
Oats.....	.890	.092	.532	.624	1:5.8
Barley.....	.891	.087	.962	.779	1:8.0
Buckwheat.....	.874	(.078)	(.548)	(.626)	(1:7.0)
Rye.....	.884	(.064)	(.703)	(.767)	(1:11.0)
Peas.....	.856	.188	.535	.723	1:2.8
Sorghum Seed.....	.873	(.054)	(.668)	(.722)	(1:13.3)
BRANS, MIDDINGS AND MEALS.					
Bran (wheat)...	.881	.120	.454	.574	1:3.8
Bran (rye).....	.884	(.115)	(.488)	(.603)	(1:4.2)
Middlings (wheat).....	.879	.128	.609	.737	1:4.8
Middlings (buckwheat).....	.868	(.237)	(.505)	(.742)	(1:2.1)
Shorts (wheat).....	.892	.122	.586	.708	1:4.8
Corn Meal.....	.850	.055	.711	.766	1:12.9
Corn and Cob Meal.....	.849	.044	.665	.709	1:15.1
Barley Meal.....	.881	.074	.668	.762	1:9.3
Pea Meal.....	.95	.168	.531	.699	1:3.2
Linseed Meal.....	.899	.289	.449	.738	1:1.6
Cotton Seed Meal.....	.918	.372	.437	.809	1:1.2
MANUFACTURED FEEDS.					
Gluten Feed.....	.917	.194	.633	.827	1:3.3
Gluten Meal.....	.922	.323	.725	1.048	1:2.2
Hominy Chop.....	.889	(.071)	(.795)	(.866)	(1:11.2)
Brewers' Grains (dried).....	.917	.168	.471	.639	1:2.8
Brewers' Grains (wet).....	.243	.043	.128	.171	1:3.0
Malt Sprouts.....	.898	.186	.403	.589	1:2.2
BULKY VEGETABLE FOODS.					
Potatoes.....	.211	.009	.157	.166	1:17.4
Carrots.....	.114	(.009)	(.089)	(.098)	1:9.9
Beets (Sugar).....	.135	.016	.109	.125	1:6.8
Mangel-Wurzels.....	.091	.011	.054	.065	1:4.9
Rutabagas.....	.114	.010	.085	.095	1:8.5
Turnips.....	.095	.010	.077	.087	1:7.7
Red Clover.....	.280	(.028)	(.153)	(.181)	(1:5.5)
Alfalfa.....	.916	.104	.430	.534	1:4.1
DAIRY PRODUCTS.					
Buttermilk.....	.082	.028	.050	.078	1:1.8
Milk.....	.127	.631	.137	.168	1:4.4
Skim Milk.....	.095	.035	.057	.092	1:1.6
Whey.....	.070	.008	.059	.067	1:7.4

ROBT. H. ESSEX.



A Closed Roosting Coop for Cool Weather.

induced a confidence in their attendants that made all the difference during show week.

The daily food during these forcing days consisted of mash early in the morning (a small amount), wheat, oats or barley or buckwheat in litter at about ten a. m. and two p. m. and corn at six p. m. Sunflower seeds were frequently

CARE OF THE GROWING STOCK.

Successful Poultry Raisers Give Their Favorite Methods of Caring for and Managing Chicks from Six Weeks to Six Months of Age—Original Plans of Roosting Coops—Range for the Youngsters—What and How to Feed.

[In line with the symposium on "Feeding Brooder Chicks," and "Care of June Chicks," we present the following additional methods in use among prominent breeders for bringing their growing stock to a vigorous maturity. The advice here given is of great value, as it is the result of experiment and observation by men whose successes qualify them to take rank among the foremost producers of good poultry.—EDITOR.]

COLONY COOP FOR GROWING FOWLS—GRASS RUNS AND SHADE—CONDITIONS AND FOOD THAT PRODUCE BIG COCHINS.

 OUR chicks (Cochins) are hatched by both hens and incubators. We use outdoor brooders, called 200-chick size, and place from forty to fifty in each brooder. When the chicks are about six weeks old and are nicely feathered we divide them into lots of twelve each, keeping the cockerels and pullets separate. They are then placed in weaning coops, which are 5x6 feet, ground plan, and three feet high in front and two feet at the rear. (Fig. 1.)

These coops are provided with frame doors hinged on the inside and covered with one-fourth inch mesh screen.

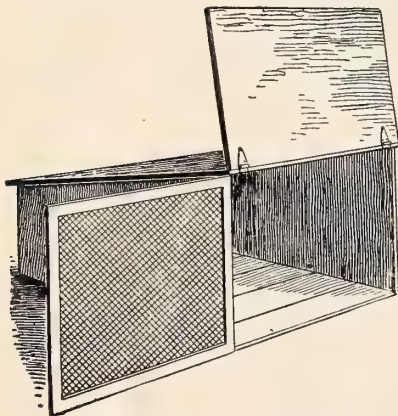


Fig. 1—Coop with Double Doors Used by A. W. Rudy & Son.

On the outside a solid wood door is hinged at the top. This door can be raised or lowered or closed entirely, as the state of weather may require. On warm summer nights the screen door is closed and the wood door is lowered and propped to provide shelter in case of a windstorm or hard rain. This arrangement gives the

chicks plenty of fresh air, and at the same time protects them from vermin and night prowling animals.

Having an abundance of green grass and shade, these weaning coops are almost constantly on the move. This reduces to a minimum the possibility of disease arising from accumulated filth, as is almost sure to occur if the chicks are compelled to live on ground saturated with poisonous excrements. During these stages of development they are given a thorough dusting of Persian insect powder once a week. This treatment we consider to be very important, as we have found by experience that lice cause more trouble than all other ailments combined.

From the ages of six weeks to six months the chicks are fed cracked corn, pure clean wheat, hulled oats, and at noon are given a mash feed of some good poultry food, and once a week we add to this ration, fresh ground green bone.

We never use any drugs or condiments and have no secret method of getting our Cochins so large, as we have

found that if fresh pure food is used, combined with a little brains while using it, and the chicks are kept under conditions that will enable them to assimilate what is given them, their growth will be rapid and their development perfect.

We are very careful when selecting the chicks to make up a colony, to see that they are all of the same size and of equal development. If any show a tendency to going back, or slow development, they are immediately removed and placed with a younger flock, where they will have at least a fighting chance to keep up with the procession. When six months old they are placed in larger houses, the floors of which are covered with a thick bed of straw. Cochins have no use for roosts till they are at least one year old.

A. W. RUDY & SON.

RAISED IN AN ORCHARD—ALLOWED TO "HAVE THEIR OWN WAY"—VARIETY OF FOOD.

In regard to our care and management of chicks from six weeks to six months old, we have a large apple orchard near the house which has been fenced in and made into four large yards. A brooder house, or "summer home" for chicks has been placed on the dividing line between the yards, so that at this age we are able to separate the young pullets and cockerels, giving them separate yards and roosting places in the buildings. We have low, flat, movable roosts standing on four legs, which are placed in the buildings soon after the brooders are removed, and here you will find our chicks at night until they are from one-half to two-thirds grown.

Some of them prefer the low branches of the trees which are so conveniently near by, and as we find it means constant warfare to compel them to seek the buildings, while they dwell in the orchards, we allow them to "have their own way" until the unpleasant fall weather sets in, when they are removed to winter quarters and sheltered at night. We have a "cornfield" adjoining the yard in which the pullets are allowed to roam one day, and the cockerels the next. They always come home to roost and be fed. We usually put about as many in each yard as we can get of the same age and sex, varying from forty to seventy-five to the yard.

In the morning we feed a mash composed of equal parts of cornmeal, ground oats and wheat bran, with a little meat scraps added, also a very little salt. Have sometimes used a prepared poultry food in place of this mash. The mash we scald with equal parts of sweet milk and water, and feed while just a little warm. The chicks are given all the fresh skim milk and water they will drink, and a basin of "dutch cheese" is sometimes added to the mash. A little fresh cut green bone is fed once or twice a week if we can get it. At noon oats, wheat or buckwheat is scattered in the yards for them to hunt for, and at night they are fed all the wheat or

corn they will pick up. They of course help themselves to apples in the late summer and early fall, and we occasionally give them cabbage and tomatoes to pick at after the grass gets dry, or any little "treat" we happen to have for them, to give variety.

C. W. JEROME & CO.

PLENTY OF RUNWAY AND YARD ROOM—LEAN-TO COOP.

I use both incubator and hens for hatching. If the hens are slow in laying, requiring too long a time to supply a sufficient number of eggs for an incubator, I put the first two or three broody hens that I can find to work. I never set

one hen singly. If the hens lay well I set the incubator. I much prefer incubators and brooders, especially the brooder. I have hatched out chicks by hens raised them in brooders without any loss of chicks to speak of and

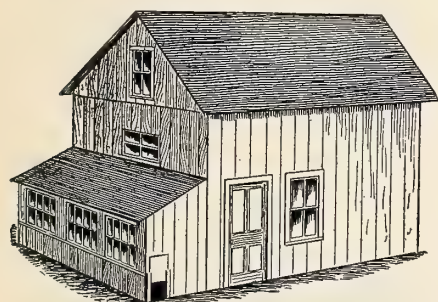


Fig. 2—Style of Lean-to Coop Used by Mr. John Hettich.

with much less trouble than watching the old hen.

I never use outside coops, even for broods with hens. I have on the south side of a main building a lean-to shed six by fourteen feet with a glass front. (See Fig. 2.) This shed I use for my young chicks. I have movable partitions and can divide it into from three to five compartments, depending on the number and the size of broods, each compartment containing a brood of chicks. From this they can run on the outside in good weather either with the hen, or with the hen confined on the inside, so the chicks can run in and out at will.

In this coop they remain until they are weaned, which is from six to ten weeks. Of course this coop must be cleaned three or four times a week, with plenty of litter or chaff on the floor, with dry food fed in litter to make them work, and plenty of fresh water. They grow and thrive from the very start. After chicks are weaned they are moved from this lean-to coop into the main room adjoining, which is 12x14. In this room they are put to roost, while other youngsters take their place in the first or young chick coop. The last lot of chicks I allow to grow up in this shed, while the first lot remain in the main room of the big building until about October 1, when the cockerels are separated from the pullets.

My cockerel house is in another part of the yard, with plenty of runway and yard room. Pullets go into my main hen house, which is 12x15, divided into two parts, with plenty of yard room to each part. I do not allow my hens and pullets to run together. I find hens get too fat on a ration that would keep a pullet starving hungry.

As to feeding chicks I find little trouble to keep them growing from the time they are six weeks to six months old on plenty of sound small grain, wheat and chopped corn being my main ration. Twice a week I feed them a full mess of wheat bran, middlings and oil-meal well mixed. I believe that oil-meal has a splendid effect in producing fine, glossy plumage. Of course, we all know that plenty of grit and fresh water are two essentials. It is the little chicks that give most trouble in getting them up to six weeks old.

I am always making a fight on lice, both on fowls and in buildings. Lice kill more chicks and grown fowls, for that matter, than all other diseases combined.

JOHN HETTICH.

MOVABLE COOPS IN BLUE GRASS PASTURE—METHOD OF FEEDING—CORNFIELD AND CLOVER FOR RANGE.

I do not have any particular style of coop—a good roof and bottom of boards always, made so that it can be conveniently cleaned. Twenty chicks to a hen I think about right. The coops are placed near the house for convenience while the chicks are young, moving them further away as they grow older. At about five or six weeks they are located near a blue grass pasture, with a number of apple trees for shade. Here they have range until cold weather drives them into winter quarters.

My first food for little chicks is dry wheat bread, moistened with sweet milk. This is good enough for the first day; the second day, oatmeal and millet seed are given, with good grit. They get water from the start. Up to four weeks old their food is bread, moistened in milk, millet seed, oatmeal cornbread, baked as for the table, and cracked wheat. After they are four weeks old I discontinue the oatmeal and bread and milk, and feed millet seed, whole wheat and cracked corn, with cornbread for breakfast, baked the day before. After the chicks are two months old I feed a bran mash, consisting of one-third each of ground oats, corn and wheat bran, moistened with milk, clabber or sour milk preferred. This I feed in the evening, all they will eat.

I follow this method of feeding the old fowls, believing the evening the proper time for soft food. For late hatched broods (say the last of June or first of July hatches) I know of no place better for cooping than a near cornfield, with a clover meadow near by. The corn furnishes plenty of shade through the warm days, and the clover field supplies grasshoppers. I have had good results from late broods raised in this manner.

O. L. KING.

ROOSTING COOP FOR YOUNG STOCK—THREE FEEDS A DAY AND PLENTY OF RANGE AND WORK.

In raising chicks, if they have been fed and cared for as they should, are free from mites and diseases until weaning time, or until they are large enough to be taken from the brooder to the roosting coop, I find that the greatest work and care of the season is over. After my chicks are six to eight weeks old I give them their liberty all through the day, except when the weather is too bad to let them run. I feed them three times a day and make them work for it all except the morning feed. For a roosting place I use coops with a floor space two and one-half feet square. (Fig. 3.) I also use these coops with a run attached for the hen and brood when I let the chicks run with the hen instead of using a brooder, so when the chicks are weaned they will continue to go home to roost.

These coops are made of seven-eighths inch matched lumber, well seasoned.

The sides can be made of lumber taken from dry goods boxes. The front should be two feet high, the back sixteen inches high. This gives sufficient slant to the top to run the water off when it rains. The back is left open and has slats nailed across to keep the hen in and to allow the chicks to pass out. This open side admits plenty of fresh air at all times. The top should project over about eight inches at back of coop to prevent the

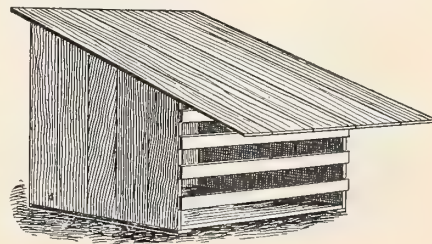


Fig. 3—Roosting Coops for Young Stock Recommended by Mr. G. E. Read.

rain from blowing in. In the front there is a door twelve inches wide. There is a bottom made by nailing boards together on two cleats, made so that the coop will slip down over the floor onto the ground. This prevents the rain from blowing under and wetting the floor. The cleats keep the bottom from resting flat on the ground. The coop should be given two coats of paint.

This kind of a roosting place is very easily cleaned or whitewashed by lifting it off the floor. When the ground is dry and warm the floor is not necessary, simply move the coop to a new spot when it begins to get foul. Twenty-five or thirty chicks can, without being crowded, roost in a place of this kind until they are three or four months old. When the chicks are raised in a brooder I prefer a roosting coop large enough to accommodate fifty. This number is as many as should be put in one flock until three or four months old. I then move them to a large roosting house, where they continue to roost on a floor until five or six months old. Sometimes I put as many as one hundred in a place of this kind. From here they go to their permanent roosting place, which is on perches made of two-by-four-inch scantling, with the top rounded a little. Whatever kind of place chicks have to roost in, it should be kept clean and free from mites. Unless you do this you will surely fail.

I have no mechanical arrangement or fixed method for feeding chicks. I always feed what I think the time and occasion demand. I believe that as much depends on the way food is prepared and manner of feeding, as on the material. For the morning meal I usually give a light feed of cornbread baked just the same as for table use, or a mash composed of bran and middlings. They will still be a little hungry, and will start out hunting what they can find to pick up. Along toward noon I scatter wheat among the leaves and litter in a large part of their range. This gives them something to do that greatly interests them until along in the afternoon. When the sun is about one hour high I scatter cracked corn, and perhaps some millet seed or wheat in some litter. This will keep them busy until about sundown, and by this time their crops are full, they have done a good day's work and are ready to go to their coop and enjoy a good night's rest.

There is always plenty of fresh water and grit where they can go to it whenever they choose. G. E. READ.

RAT AND STORM PROOF ROOSTING COOP.

The brood coop I have had most success with is made as follows: Length, twenty-four inches; height, in front, twenty inches; rear, twelve inches; width, eighteen inches (inside measurements). I make the

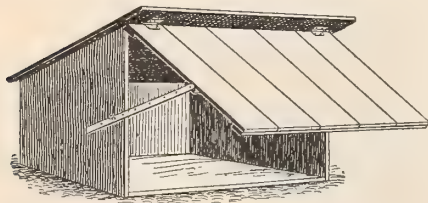


Fig. 4—Coop with Adjustable Hood Front.

coop of matched pine, with board floor, the cleats on the outside, so as to raise the coop off the ground. The top projects three inches at the sides and four inches at the rear. I make a closed front (boards the same as the coop), the front being hinged to the top, and the top and front mitered, so as to close tight when down. The coop front is kept in place by cleats on the inside, these cleats allowing about seven-eighths of an inch space on both sides for ventilation when the door is down.

The front has iron strips with three or four holes fast-

ened about the center for the purpose of forming a hood to the coop, which can be set at different angles by placing screw eyes to the sides of the coop. This feature of the coop is grand, as by the hood the hot sun can be kept out as well as driving rains.

These coops save me many chicks each season. They are rat proof and storm proof. The hen is kept in by a lath front fastened just at the edge of coop. By painting these coops and storing when not in use, they last a long time and repay for their cost many times over. When the chicks are older I utilize dry goods boxes, cut down to about the same shape, only I make a hood of the lower eighteen inches only

REV. C. A. SMITH.

ROOSTING COOP FOR STOCK UNTIL READY FOR WINTER QUARTERS—MAKING THE MASH—GRAIN FOOD.

As soon as the hen weans the chicks (or if raised in a brooder, as soon as they are large enough to take care of themselves) they are removed to roosting coops made and used exclusively for this purpose. These coops are scattered along a hedge fence facing a large orchard, where they can get range and shade at all times. The coops are made from cheap lumber,

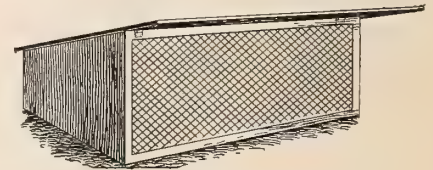


Fig. 5—Mr. F. E. Mow's Roosting Coop.

but are strong and tight. We have them from six to ten feet long, but prefer them ten feet long, two feet high at back, three and one-half feet in front, the roof projecting over the front to keep out rain. Ends and back are boarded tight, and there is also a tight floor. Front is of wire netting nailed to the frame just fitting, and hinged at the top, so as to be closed at night and to shut the chicks in when getting them used to new quarters. The coops have roosting poles lengthwise the whole length of coop. We do not find so many crooked breast bones from roosting on these poles as are found by chicks roosting on the floor. The coops must be kept far enough apart so the different flocks will not try to crawl into one coop. If possible we put pullets in different quarters from the cockerels. We have kept chicks in these coops until snow flies.

We feed only three times a day when chicks are this age. The morning and noon ration consists of corn meal (ground fine) two parts, bran one part, middlings two parts, thoroughly mixed. To this we add salt and to a peck we add one quart of meat meal. This is placed in a light vessel, boiling water poured over it and mixed to a stiff dough. We use a grain sack to cover the vessel, and pack very tightly to keep in all the steam. Let the mixture cook in its steam and feed only when cool. They are fed all they will eat up clean. At night they are fed corn, wheat and oats—very little oats, however, as we have had poor success with oats. The grains are fed alternately so they will not get tired of either grain.

F. E. MOW.

EXCELLENT CONDITIONS FOR GROWING HEALTHY BIRDS.

Living as we do on a farm, we have plenty of range, grass and shade. We have a large apple, plum and cherry orchard, also raspberry and blackberry patches, which afford fine range for young chicks. As for food, we use only such grains as we raise on the farm. When the chicks are about six weeks old we put them in flocks of fifteen to twenty-five, each flock roosting at night in a large coop having a movable bottom, so as to make it easy to clean out. There

is a wire screen door in front, so as to give plenty of air, also to make it vermin-proof at night.

As to our method of feeding, we give corn ground rather coarse, so the chicks will have something to pick at. Each morning we take what corn meal we want for a day and moisten it with milk that has been heated to the boiling point, being careful to mix thoroughly so all the meal is scalded, thus preventing danger of bowel trouble. We feed three times a day just what they will eat up clean each time.

When they are about three months old we omit the corn meal and give whole oats in the morning and noon, and whole corn at night. We let them forage through the day for bugs, grass, etc., which they need to keep in good growing condition. There is plenty of good clean water for them to drink at all times. This is one of the most important parts in raising healthy chicks. H. TIBBETTS.

BEST OF CARE—PLENTY OF FOOD—WELL VENTILATED COOPS.

We give our chicks farm range (farm consists of 269 acres) and plenty of fresh well water, also a variety of food

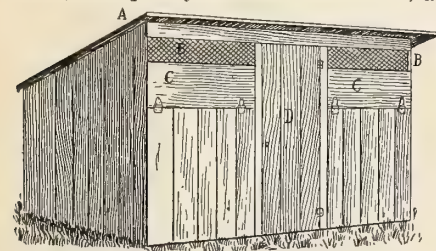


Fig. 6—Coop Used by Simon Lynch & Son.

consisting of cracked corn, wheat screenings, corn bread, potatoes, etc., and plenty of natural grit from a gravel bank. In autumn their range affords a good supply of grasshoppers. We sweep the feeding space each day, scald and clean the drinking vessels, and try to keep the chicks as free from lice as possible by keeping the floor of the roosting houses clean and the walls, etc., whitewashed frequently. We aim to give at all times the best of care and plenty of food. We keep our fowls well sheltered at night in well ventilated roosting houses, ranging in size from four by eight feet to six by twelve feet. The illustration (Fig. 6) shows a building six by twelve feet; front, six feet six inches; rear, four feet. The roof projects one foot to protect ventilators from rain. The door (D) is two by six feet. C C are doors twelve inches, hinged at bottom, to be opened for light and thorough ventilation. Above this door is a wire screen six inches wide (B) for ventilation at night or when other doors are closed. Above the door, running full length of house, is a board four inches wide to give support to roof.

SIMON LYNCH & SON.

FARM RANGE—PLENTY OF GREEN FOOD—ROOMY QUARTERS.

We have never aimed to raise over four or five hundred chickens a year, as we raise geese and turkeys and cannot accommodate a much larger flock. The young have good comfortable coops, with board floors, closed up according to the weather, with the brood hen confined accordingly. They have farm range, an abundance of grass, good water at all times and plenty of grit. Our coops are too small to accommodate them after they are quite large, so as soon as they begin to think about roosting on top of coops or a limb of the nearest tree, we put them in our large buildings, where the most of them are to be kept through the winter. Most of our old stock, kept for sitting, laying, etc., has been marketed by this time.

Our buildings are clean and free from vermin. The youngsters, if they like, can use the perches, which are two

inches wide and have rounded edges; or they can roost on the floor, which is earth, thickly covered with straw. There is plenty of room either place, with no crowding (chicks won't crowd if comfortable). When the cold rains and winter snows come unexpectedly they are comfortable. They are free from colds, nor do they have crooked breasts as some might think, for they do not have to go on the perches till they want to. We have had to put as many as one hundred and fifty in a large room, but that is too many; fifty to seventy-five are better.

These chicks are taught to roam and scratch when quite young, and are not over-fed on grain too easily gotten. When past their chick food they are fed twice a day with a mash consisting of corn meal, middlings and bran, about equal parts, scalded and salted. A third meal, the night one, consists of cracked corn, wheat or screenings, fed in the straw so that they have to work for it. A little meat in some form is fed every few days, and they are given anything in the form of vegetables, cooked or raw, that they will eat that we happen to have, and we usually have something of the kind. Our large orchard and grove furnish an abundance of shade, sometimes too much when it is a little cool. We never neglect the young, nor feed them more or less in quantity than they require, which varies according to age and weather, and no one but the feeder can tell how much. We used to overfeed, which is easily done, though some people actually starve their poultry and of course have "bad luck," while the real cause is death from neglect.

We do not expect to raise every chick, but are satisfied with a good per cent. We lose but few after they are placed in the large buildings, and those are by accident. This season we expect to keep many of the incubator chicks in the brooder houses till late fall or winter. The flocks spoken of were raised by hens. B. F. HISLOP.

A COOL AND SAFE COOP FOR FORTY YOUNG FOWLS—MOVED TO FRESH GROUND WEEKLY.

I have several coops for young chickens that are two and one-half feet high at back, three and one-half feet in front, three and one-half feet wide and from six to eight feet long, with heavy water-proof paper on top of roof. I try to set from three to five hens at one time and put all the chicks with two or three of them in one of these coops. When the chicks are about a week old, if the weather is good, I let them out. They will return at night and when weaned will roost in these coops of their own accord. Then I make a frame in front (two feet wide) covering it with poultry netting (small mesh). I leave an opening in the back eight inches above the roosts and cover with wire netting. The fowls are then safe from minks, rats, or any other animals, and still have a circulation of fresh air. The roosts in coop are about a foot from the ground.

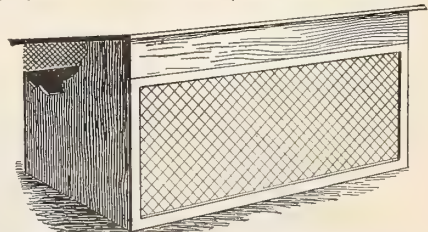


Fig. 7—Mr. D. F. Palmer's Movable Coop for Forty Chicks.

I clean the coops once a week and set them on fresh ground. These coops will accommodate about forty chicks. Late in the fall I line them with paper to prevent drafts, and when cold weather comes the chicks are in fine shape to go into the houses. As to food, I am feeding small shrunken wheat from the mill. Of course fresh water is before them at all times. D. F. PALMER.

FEEDING THE CHICKS.

We have had experience in raising chicks in brooders for many years and we have been successful. We never put more than seventy-five chicks in a lot and we use the dry food method entirely. Some years ago we found that it was not possible for us to give the chicks the time necessary to success, as our fruit business at times claims almost all our attention. We therefore dropped the brooders, retaining our incubators and giving the chicks to broody hens, placing the hens in the house formerly used for brooders until the weather allowed us to put them outdoors.

The method of feeding which we employ for chicks after being fed for a week or so on crumbs, boiled rice, etc., is for morning: One quart sifted cereals, ground fine, one pint wheat bran, two ounces meat meal and moisten just enough to adhere slightly together. Noon, feed cracked corn, barley, hulled oats. Feed just what they will eat up quickly. At night we feed cracked corn, hulled oats, wheat, and a mixture of any small grain we may have. We find that the meat meal has been a great help, and all our chicks made splendid growth in bone, and we have not the proportion of puny birds that are so common in nearly every flock.

We prefer hen-raised chicks for many reasons, and we will name some of them. First, you do not get so many crowded in a bunch; second, the hens exercise them hunting bugs and teach them to hunt for something to eat instead of lying around waiting for the feeder to come; third, our hens will average ten chicks each and thirty hens will

raise us three hundred chicks, which is as many as we wish for our present quarters. We give Game hens Game chicks, as they will hover them until full feathered and raise nearly all given them. White Wy-

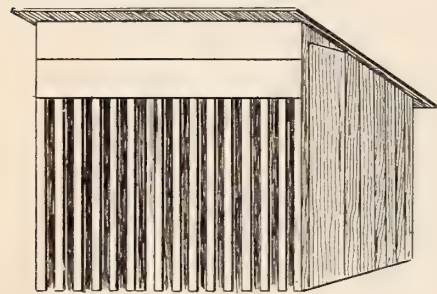


Fig. 10—Slatted Front Coop with Door at Side.

andottes leave them in six or seven weeks to do for themselves, and they get colds and the attendant diseases and die off. We would rather raise one well developed chick than twelve poor ones, and by our method we have few culls.

S. D. & J. W. RILEY.

THREE GOOD COOPS—MOVING THE YOUNG STOCK
—COOKED FOOD AND GRAINS.

I send a pencil sketch of coops used by me. No. 8 is the old A coop for hen and chicks. I have found this to be about as satisfactory in the long run as more expensive ones.

No. 9 is a little more expensive and if made right is very convenient, easily kept clean and safe from night prowlers. I often

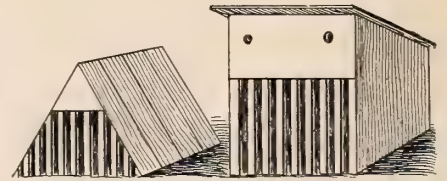


Fig. 8-9—Half-way Coops to Use Between Brooder and Fig. 10.

make use of these coops as a

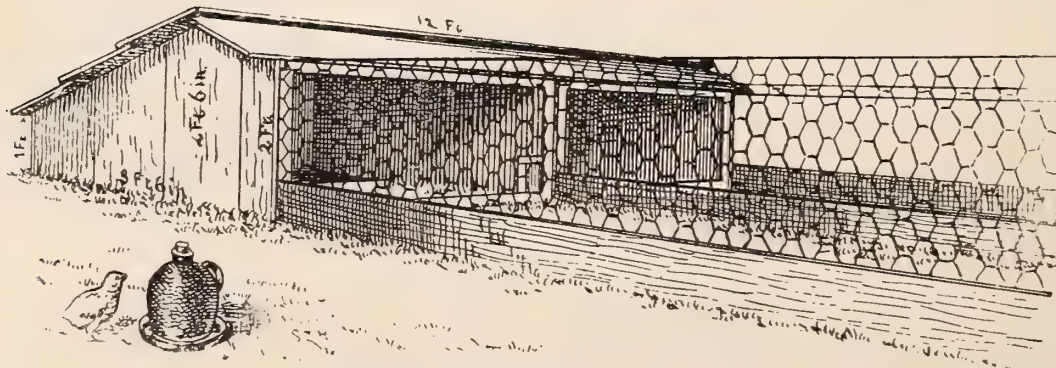
half-way house from the brooders to coop or house No. 10, as I can limit the number of chicks to suit size, weather and other conditions. If the weather is cold and damp I often use a jug of hot water, set in the middle of the coop. It is a good thing and the chicks appreciate it, as one can soon tell.

I use one incubator, and with it I have three brooders—No. 1, one hundred chick; No. 2, three hundred chick; No. 3, five hundred chick size, so-called.

They go from the incubator to brooder No. 1, which I have ready for them with a temperature of about 90 degrees to start with; from No. 1 to No. 2, then as age and size warrant they go to No. 3. No. 2 has outside runs; No. 3 is an outdoor brooder and chicks have a good grass yard and plenty of shade. I bunch them up in small colonies of about fifteen in the No. 9 coops. Fresh water and grit are where the chicks can get to them all the time.

The food question is one that bothers me more or less. All my fowls, old or young, get one cooked ration every day—in the mornings. For this I use oats, corn chop, clover (cut), bran, shipstuff and beef or blood meal. This is prepared the night before, and as soon as the young stock get old enough they get a portion, the same as the old stock. I feed corn chop, wheat and millet, green cut bone and vegetables, table scraps, and anything I can find that is good for them. I aim to give my chicks as much variety as possible. Oat groats is a principal factor in my food for growing chicks.

E. M. DURHAM.



A Shelter Coop for Growing Chicks.

PROFITABLE BROILER RAISING.

This Profitable Branch of the Poultry Industry Discussed in Detail, from the Hen That Lays the Egg to the Profits That Go Into the Pockets of the Successful Broiler Raiser—Suitable Breeds for Broilers—Vigor and Shape in Breeders—Seasons of Incubation and Prices of Eggs—Seasons of Sales and High Prices for Broilers—Period of Growth to Marketable Size—Special Foods an Aid to Growth—A Clue to the Profits.

By A. F. Hunter.

HERE are several interesting features manifest in different lines of poultry work, and not the least of them is the fascination of broiler raising for the beginners. That the promised profits of turning eggs into a choice marketable fowl product does fascinate the beginner is well known to those who have studied conditions in the poultry business, and perhaps the most frequently recurring question coming to the poultry editor's desk relates to one point or another of broiler raising. Nor is this surprising when we consider that the changing of an egg into a chick is but a matter of three weeks' time, and the growth of the baby chick to a marketable broiler is but a matter of eight to twelve weeks' time. Somebody says, "An egg costs two or three cents, and in three months we can turn it into a two-pound broiler which will sell for a dollar; that certainly looks an easy way to make money. And it would be if every egg produced a chick and every chick grew to broiler size and good, marketable condition, and sold for fifty cents a pound; but, there are eggs and eggs, and there are broilers and broilers, and there are not a few difficulties in the way of realizing the Klondike profits which look so tempting. That there is a good profit in broiler raising there is ample evidence in the sections where market poultry is made a business, and where men have continued the raising of broilers and soft-roasters for ten, fifteen, twenty or more years. That many who embark in broiler raising gradually outgrow "the broiler stage" and develop into larger things is not surprising. We have in mind such widely known poultrymen as A. G. Duston and Wm. Ellery Bright as examples of broiler (and market poultry) raising having been the stepping stone to the great poultry business they have built up; indeed, not more than six or eight years ago Mr. Duston wrote interesting and helpful articles for the Reliable Poultry Journal upon this subject and his poultry plant was planned and built with the intention of making broiler raising a prominent feature in his poultry work.

There are great poultry farms where broiler raising is a considerable part, or even the chief part, of the work, and where incubators are kept running practically the year around. On others the broiler work is simply one feature of the general poultry work; the intention being to have a good crop of broilers to meet the high-priced market, and a succession crop of soft roasting chickens to meet the high-priced market for roasters, and a general "market poultry and eggs" business for all the year. There is still another class of broiler raisers, those who turn off their young cockerels to market just as soon as they are of marketable size, considering them simply a by-product of the general poultry work.

Prices Go Up, Then Down.

There is very little sale for broiler chicks in October, November and December, at least in the general market; some sale there is, to private trade, and in such case very

little attention is paid to market quotations, the prices being simply between the grower and his customer. In January there is a light call for broiler chicks, which steadily increases through February and March and culminates in April, then gradually decreases through May, June and July, and by August the lowest prices are again reached. These lowest prices range from twelve to twenty cents a pound, and the highest prices range from twenty-five to fifty cents a pound, the sale price depending upon the quality of the product and the demand in the market. The chickens must be "gilt-edged" to command the highest figures, and if of extra fine, "gilt-edged" quality they not only sell quickly, but frequently command a premium above highest market prices.

These broilers are in greatest demand in April, with a good demand in March and May, with a moderate demand from New Year's to August. In the best markets, which are those of our greater eastern cities, the prices range from about twenty cents a pound in January up to fifty cents a pound in April, then gradually fall off to about twenty cents again in August. Not all two-pound chickens, however, are "high-class" broilers and command the highest current prices; to command the highest prices they must be of "the best" quality, must be plump, full-breasted, yellow-skinned and fine-boned, and the quicker a chicken can be grown to broiler size the better in quality it will be. The better the quality the higher the price and consequently better profit to the grower. If a two-pound broiler costs twelve and a half cents a pound to raise and is of such fine quality that it sells for forty or fifty cents a pound, there is a profit of twenty-seven and a half or thirty-seven and a half cents a pound; if, however, it is "off" in quality and sells for ten cents less per pound, there is but seventeen and a half or twenty-seven and a half cents a pound profit. This one point of poor quality and consequently lower price has discouraged (or disgusted) not a few broiler raisers, hence the importance of getting eggs from stock of the much desired fine-boned, plump-breasted yellow-skinned class of fowls, to the end that, if fed right and cared for as they should be, they grow (and grow quickly) into broilers of the very best class.

That there has been little change in market conditions in the past dozen years is shown by the price-list given in the circular of Messrs. W. H. Rudd, Son & Co. in 1891, which reads as follows:

Quotations for Broilers.

January, demand light.....	15 to 20c
February, demand improves.....	20 to 22c
March	28 to 35c
April	35 to 50c
May	40 to 30c
June	30 to 25c
July	25 to 20c
August, prices fluctuating.....	16 to 23c
September	12 to 16c
Oct., Nov. and Dec., little demand.....	12 to 15c

**PROFITABLE
MARKET
CHICKENS.**



Illustration Referred to by Mr. Hunter.

In November, 1901, *Reliable Poultry Journal*, we told of a decidedly successful broiler raising business, and gave a table of shipments of about four thousand broilers, with prices taken directly from Mr. Twining's books. We reprint the table so that prices may be compared with those of Mr. Rudd, published ten years earlier.

These returns are from (practically) weekly shipments, while the prices in the first table are designed to give the average prices for each month. Another point worth noticing is that Mr. Twining shipped to both Philadelphia and New York markets, and sometimes could get a few cents better price in one market than in the other. For example, May 3rd and 8th shipments to Philadelphia only returned him thirty-five cents a pound. He shipped no more for nearly two weeks and then shipped to New York and received forty cents for them; another shipment returning him thirty-six cents, and not until June 3rd was the New York price down to thirty-five cents, which was the Philadelphia price just a month earlier. It is worth noting that the Boston prices for May are given as forty to thirty cents, which approximates closely to Mr. Twining's actual returns ten years later; a comparison of these prices shows that there is but little variation in prices from year to year.

Mr. Twining's figures give us a clue to profits. He tells us his two-pound broilers cost him twenty-five cents apiece, and divides the cost as follows:

Two eggs	5c
Labor	7c
Food	8c
Picking	5c

Total 25c

As he and his son did all the work, it is obvious that the seven cents for labor was put into his own (and son's) pockets, and that they got the full price of their labor in addition to the profits returned. The figures give us twelve and a half cents per pound as the cost of a two-pound broiler and the market prices ranged from twenty to fifty cents a pound. A two-pound broiler selling at twenty cents a pound pays fifteen cents profit, while the same broiler selling at fifty cents a pound pays seventy-five cents profit. Quite a difference there, and the figures show the importance of having the product ready to market at the time of highest prices. This is the month of April, but March and May also give high prices. It takes nine to twelve weeks to grow a two-pound broiler, and that means that the chicks must be hatched in December, January and February to come upon the market in time for best prices.

Table of Shipments and Returns of Mr. Twining's Broilers.

DATE.	No. Chicks,	Returned.	Price Per Pound.
April 25.....	50	\$ 25.00	.50
" 25.....	50	27.92	.48
May 3.....	50	23.01	.38
" 3.....	100	38.74	.35
" 8.....	50	22.19	.35
" 20.....	240	140.74	.40
" 27.....	200	119.67	.36
" 27.....	6	4.10	.35
June 3.....	201	123.68	.35
" 10.....	6	4.12	.35
" 10.....	252	145.33	.32
" 17.....	13	7.80	.32
" 17.....	250	132.44	.32
" 24.....	250	127.78	.30
July 1.....	209	109.85	.30
" 8.....	253	128.20	.30
" 15.....	205	98.40	.28
" 22.....	157	81.19	.28
" 29.....	274	102.18	.23
Aug. 5.....	267	97.33	.20
" 12.....	432	133.16	.20
" 13.....	120	33.28	.20
" 19.....	270	94.02	.20
" 19.....	54	18.90	.20
Total	3,959	\$1,839.03	

Average Price per chick, 46.45 cents.

Eggs for Hatching Broilers.

The first problem, and one of the most important to the broiler raiser, is the eggs from which to hatch the chicks. It is November, December and January eggs that produce the December, January, and February chickens, and eggs in those months are scarce and high. Eggs at this writing (February) are selling at forty-five cents a dozen, wholesale; nearly four cents apiece. It is evident, then, that eggs at this season are worth decidedly more than the two and a half cents apiece figured by Mr. Twining. His figures, however, extended into and through the period of lowest prices for eggs, and the books showed that his average for the (about) nine thousand eggs incubated was nearer twenty-five cents a dozen than the thirty cents of the figures. We visited a large practical poultry farm early in December and found the owner just closing a case of fine looking eggs he was sending to market. We asked him if he was selling any eggs to market poultry raisers and he replied, "No, sir! It don't pay to bother with that trade. I'm getting forty-five cents a dozen wholesale for these eggs, and the most that market poultry raisers will pay is five dollars per hundred; that isn't difference enough to pay me for packing them to ship by express and pay for correspondence, time, etc., that it takes." As we had visited a market poultry raiser only a couple of days before and he had exclaimed about the difficulty of getting good hatching eggs to fill his incubators, a comparison of the two differing points of view is interesting. The one man had the eggs in good supply, said he was getting a hundred and over a day and could no doubt ship five or six hundred eggs a week if the other would offer a price which would make it worth while taking care of the orders. Five dollars per hundred did not tempt him, possibly six dollars per hundred would.

"Good Hatchable Eggs."

Next to getting eggs to put in the incubators the most important matter is the quality of the eggs, is the getting of good, strong bodied eggs that will hatch out strong, vigorous chicks. Indeed, it may well be stated that the quality of the eggs is the most important point; it isn't an impossibility to get one or two or three thousand eggs, but to get eggs which will turn out a reasonable proportion of sturdy, "bound-to-live" chicks is more difficult. This brings us to "the hens behind the eggs," as it is impossible that eggs be in the best

shape to hatch good chicks unless the hens that produce them are in high condition. They must be in perfect health and be fed a food ration that supplies the elements of which good eggs are made in addition to the food (which must include a sufficient supply of green food to "balance" the grain and animal foods), the fowls must be kept in clean quarters, must be kept free from vermin, must have an abundance of fresh air to breathe, and must have sufficient exercise to keep the circulation active and promote good digestion. This looks formidable at first, but is really nothing more than common prudence dictates, because "the hen that lays is the hen that pays," and the hens must have good food and care if we expect them to lay.

The term "quality of the eggs" means much more than the average reader will realize. It is most important that eggs for market be of good quality, be strong-bodied and full-bodied; if less than this they are seconds or thirds and sell for a lower price. Of how much greater importance that they be strong bodied and full bodied if they are to be incubated. If weak



The Profitable and Unprofitable Type in Market Fowls.

Illustration referred to by Mr. Hunter.

and watery they can not hatch good, strong chicks. There may be sufficient body to the egg to nourish the embryo (and beyond) the critical period of exclusion, but the infant chick will be so weak and feeble it cannot "make-a-live"

of it; or it may be still poorer and the embryo die in the last week of incubation; and some eggs are so poor the germs die in the first few days of incubation. When eggs are very poor in quality there will be many of these dead germs found in the incubator at the end of the hatch, or thrown out at the second test; it is perhaps unnecessary to say that such poor quality eggs are the most unprofitable and most unsatisfactory for the market poultry raiser to buy.

The Hens That Lay the Eggs.

The witty "Autocrat of the Breakfast Table" said that the education of a child should begin twenty years before the child is born, and, similarly, the strength and vigor of our broiler chicks must be planned for one or more years before the eggs are laid from which the chicks are hatched. The laying hens must be birds with strong constitutions and themselves descended from birds that had strong constitutions. An old poultryman, in an article written for the *Reliable Poultry Journal* a few years ago, says:

"Instead of beginning with the egg which is to produce the chick we go farther back, even back of the hen which lays the egg, and find the health and strength of her ancestry. In other words, we examine her family tree. If, on due investigation, we find the hen which is to lay our eggs is the offspring of some generations of strong, healthy birds, we may safely depend on her giving us the proper material on which to build our broiler structure. There never has been, and never will be, a successful broiler business built up on eggs from other than stock in perfect health and of strong vitality. The reasons are plain to see. In order to get your quick grown, juicy carcass there must be a forced growth from the very hatching, and the chick must have the stamina and vitality which alone come through inheritance, and which enable him to stand the hardest feeding and keep him busy and happy. The chicken from poorly fed, ill developed parent stock of hit and miss breeding cannot and will not fill the bill."

How to get the desired strong constitution is an important consideration, and it is evident that we should both breed for it and "select" the breeding birds for it. Prof. Graham, of the Ontario Agricultural College, Guelph, has given much study to this subject, and in an excellent article published in the *Reliable Poultry Journal* he discusses the question of the constitution of the breeding stock, and illustrates his points with photographs from birds of both the desired and undesirable types. Mr. Graham says:

"I am of the opinion that one of the most important points to be considered is constitution. This may have no actual market value, but it certainly has much to do with the bird's ability to grow and put on flesh. What we want is a good feeder and an economical producer. Generally, a bird with a short, stout, well curved beak, a broad head, not too long, and a bright, clear eye, will have plenty of constitution. Furthermore, I have noticed that when a bird has a long, narrow beak, a thin, long comb and head, and eye sunken in the head, it is lacking in constitution. It also has a narrow, long body, and in many cases legs which are long, and upon which the fowl seldom stands straight. There are some exceptions to these points, yet, upon the average, if a bird has a good head, the chances are favorable for a good body, and if a poor head, the opposite may be said. I have frequently noticed in Rose Comb breeds, such as Wyandottes, that you seldom see a good shaped one that has a long, narrow comb.

"The neck of the market fowl should be moderately short and stout, indicating vigor. The breast is the most important point in a market chicken. It should be broad, moderately deep; and, if fairly long, will present a fine ap-

pearance and appear well fleshed. It is quite possible that a broad, deep breast will carry more meat than a moderately deep breast of the same width, yet there is no doubt but that the latter will present much the better appearance and thereby sell quicker, and at a higher price in the market.

"When considering the length of breast, we must try to get it to come well forward (see Fig. 1), and not cut off at an angle, as seen in Fig. 2. The body, in general, should present the appearance of an oblong, when the head, tail and neck are removed. We frequently see birds that are very flat in front and cut up behind as seen in Fig. 3. This class of chickens gives a very short breast; and if it happens to be deep, as it is in this bird, you will have, when dressed, about as poor a looking chicken as one could wish to see, there being a lack of width and length of breast, with excessive depth. (Notice the head is narrow and long, the body is narrow, the eye is bright, but slightly sunken, the legs are long and not straight under the body.) In Fig. 2, note the very flat breast, the length of back, the long neck and head, the narrow comb, the sunken eye, and the length of legs. The breast comes fairly well back, but not well forward. In Fig. 1 the bill is short and stout, but not as well curved as I should like. Note the breadth of the head, the prominence and brightness of the eye, the short and stout neck, the great width of the breast, the fullness caused largely by the breastbone extending well forward, the short, stout legs that are straight under the body, and the width between the legs. There is an expression about this chicken that impresses one as being the essence of vigor.

"The back should be broad to give lung and heart capacity, and, further, this width should extend well back to the tail-head. Avoid the wedge-shaped back as seen in some fowls that have great width at the shoulders and taper rapidly toward the tail-head.

"It is much easier to get good shaped market females than it is to get good cockerels. * * * The farmers have gone to raising big chickens and are asking for large, overgrown cockerels for breeders and, further, birds that have excessive depth. The result is, we get chickens when dressed weighing four to five pounds each that have immense, high breastbones and very long legs. These are not attractive to the buyers and sell at a less price per pound than plumper birds. For example, if given two birds of the same width of breast, one is one and a half inches deeper in the breast than the other, the result will be, the one bird looks plump and sells readily, the other lacks plumpness and sells slowly. This can be bred out by using such males as Fig. 1.

"I wish to have birds as well built as we can get them. Fig. 1 is as near the ideal market chicken as I have seen in the breed he represents. The hen as seen in Fig. 4 is of a good market type. Note the width and fullness of breast. As a breeder she is a little fine in bone, and rather too small. She has, however, that blocky appearance that is desirable."

There has been far too great a use of big, coarse breeding males, the thought appearing to be that size (mere "bigness") indicated a strong constitution, and the note of warning sounded by Prof. Graham is most timely. In broiler chickens, too, fineness of bone is most important. The fine-boned carcass gives a larger proportion of meat to bone (waste), and the coarser framed bird has the knife-edge breast, rather than the round, plump breast which has so attractive an appearance. Then, too, the finer boned birds take on fat more readily; it will generally be found that the birds which will not fatten and that it is seemingly impossible to get in good, marketable condition, are the long-legged, thin-bodied, angular birds begotten by the big, coarse ancestors which have come to be used because of this

craze for mere "bigness!" If we will but take heed of the suggestions given us by Prof. Graham there will be a notable improvement in the "type" of bird we send to market; the improvement in type resulting in a bettering of quality, an increased price, quicker sales and better profits to the poultryman.

I spoke of the remarkable attraction that broiler raising seemed to have for the beginners in poultry work, and to such the very great bettering of incubators, brooding and feeding comes as a great boon. The distressing failures, such as I have seen many of, should now be less common. One such, in a pleasant town about thirty miles west of Philadelphia, is worth citing as a warning. In this case two young men from the city had thought to better their pecuniary condition by broiler raising. They built a hot water pipe brooder house a hundred feet long, bought five hundred eggs and went to work. A friend with whom I was making an over-night visit told me of their poor success, and suggested that we drive over in the morning and see them. When we arrived we found them contemplating an incubator full of eggs which should have hatched the day before, and from which not one chick had come. Closing the shutters (the incubators were being run in the old

dampers as the temperature falls or rises from the point desired. Moreover, the hovers are not back against the walk partition, but out about three feet from it; there is no confined (dead) air under such hovers and no possibility of chicks crowding each other back against a back wall and smothering some. Of course such a brooder house costs more than a cheaply built and inadequately heated one, but it "raises the chicks," and therefore pays the added cost over and over again, instead of aiding to pass them along to the fertilizer heap.

Must Be Well Hatched.

Chicks to grow well must be well hatched. It is a serious handicap to the baby life to have great difficulty in getting out of the shell; sometimes the struggle for exclusion is so violent and exhausting that the chick has little chance of making a live of it. There are various causes for this, such as too high or too low average temperature in the incubator, irregularity of temperature, and other eccentricities; poor eggs, owing to the laying stock being out of condition, is another potent cause. With the well made, up-to-date and well ventilated incubators of to-day there is no reason for poorly hatched chicks if directions are closely



Colony Houses and Yards for Maturing the Growing Stock on the Farm of J. D. Nevius.

farm house parlor), we tested about half the eggs, and told them they hadn't ventilated the incubator at all (apparently), and their eggs were only about half fertile, so they were only entitled to about one hundred and fifty chickens anyway.

The air was "blue" there for a little while, but talking did no good, and while they in their lurid dreams had pictured a chicken hatching from every egg (in winter at that!), the potent fact was their work was a failure. They had already incubated over two thousand eggs and hatched less than three hundred chickens, and the brooder house showed at a glance the moment we entered it that no one could "raise" chickens in it. There was a "chill" in the air that went to the marrow, and chicks cannot possibly be grown in such an atmosphere. The brooder house had been built with half-dried lumber, after freezing weather came in the early winter, and to save fifty dollars or so a heater two sizes too small had been bought. There was no heat except the two flow and two return pipes under the hovers, and the hovers were close up against the partition along the walk. Compare such a defective brooder house with the one in use at Lakewood Farm, illustrated on pages 14 and 15—A New Jersey Brooding House. There is a brooder house equipped with abundant heating pipes under the hovers, having a bank of auxiliary heating pipes along the walk, to warm the house, and an adequate heater for the coldest weather. Then there is an electric regulator connected with a thermostat under one of the hovers, and which opens or closes the

followed, provided, of course, that the eggs are good and strong. The most important thing is that the right temperature be maintained in the incubator, and that it be steadily maintained. It is wiser to err upon the side of a bit too high temperature than letting it run low; it is the opinion of incubator operators that just a little too much is better than running the risk of the temperature going too low. This is especially true in winter hatching. As a general rule, the colder the weather the stronger (or slightly higher) the average temperature should be.

Running an Incubator.

The daily task of running an incubator consists of turning the eggs twice a day, morning and night, and daily filling and trimming the lamp. Ordinarily the lamp trimming can best be done about the middle of the afternoon, in the interval between feeding the chicks and before the last feeding of the hens. About the seventh day the eggs should be tested, which is the simple operation of passing the eggs, with the large end up, before a testing light and noting if the egg contains a living germ. The germ is a dark (almost black), spider-like spot upon the side of the yolk, and the stronger and darker the germ appears the better. An egg which is absolutely clear is infertile, and should be saved out to be eaten in omelettes or scrambled, or sold to the bake shop to be used in cooking. Now and then a dead germ will be found, evidenced by reddish circles about the yolk or a generally cloudy appearance of the egg. These should be thrown in the manure pile, or may be fed to hogs.

After the test there will be fewer eggs left in the machine, but as each egg contains a life and life means animal heat, we may soon expect to note a slight increase in the temperature. This should be met by slightly turning down the nut on the regulator rod each day, or every other day, as the conditions seem to require. The directions sent out with each incubator are the guide to follow, and these directions say 103 degrees is the proper temperature to maintain. As we said above, we would err on the side of a bit more than the designated temperature, rather than fall below it. One of the most successful incubator operators of our acquaintance does not pretend to keep his machines at exactly 103. He says that atmospheric conditions vary, causing variations in temperature, and if he keeps between 101 and 105, with an average close to 103, he gets good hatches of strong, vigorous chicks.

Most operators test the eggs a second time about the fifteenth day, testing out the dead germs and leaving in only the strong and vigorous germs. An expert operator can tell on the fifteenth day pretty nearly how many chicks he will get from the hatch, so familiar does he become with appearance and condition of the strong, vigorous embryo chicks.

When the first chicks begin to pip the shells close the ventilator slides almost wholly and keep the doors of the incubator closed until the hatch is well over; it is better to leave the machine entirely alone for the twenty-four to thirty-six hours during which the chicks are hatching. A good, strong heat, even up to 104 or 104½, is desirable at hatching time, as the chicks come out faster and better. When the hatch is well over open the ventilating slides again, to give the baby chicks more air, but do not take them from the incubator till twenty-four hours after the hatch is over.

Brooding and Feeding the Chicks.

The temperature under the brooder hovers should be about 95 degrees at first, gradually lowering it to 90 degrees when the chicks are about a week old, and thus dropping about five degrees each week. An experienced chicken raiser says he wants the heat under the hovers to be 90 when the chicks are put in, and that their heat will bring the temperature up to about 95 degrees; lower it to 90 by end of the first week, 85 at end of second week, 80 at end of third week, 75 at end of fourth week, and so on. In such a brooder house as the one at Lakewood Farm (mentioned above), the hover pipes are about three inches from sand floor in the small pens next the heater where the baby chicks are put. The space between pipes and floor gradually increases until it is about eight inches at the end furthest from the heater where the oldest chicks are brooded. It is the custom to move the chicks along as they increase in size, they being driven from pen to pen through a sliding gate in the partition between the pens.

One of the most successful broiler raisers of my acquaintance has smaller brooder houses (ten of them), each about sixty feet long, and the chicks are never moved from the pens in which they are first put until they are taken out to dress for market.

On another very successful broiler (and roaster) farm, they have removed the hovers from the brooder pens, built up the sand floor an inch higher, and the chicks put their backs up against the warm pipes,—just as they do against the hen's body when brooded by a hen. It looks comical to see the chicks under and between the hover pipes, their tiny heads sticking above the pipes quite frequently. The owners say they get better results since they removed the hovers, that the chicks grow better and faster. On page 78

we give an illustration made from a photograph of the interior of a brooding house on the Jordan Farm, where no hovers are used.

Feeding the Chicks.

Feeding has been the stumbling block over which many a would-be broiler raiser has fallen. The dismal wail of "bowel trouble," usually caused by improper feeding (although too much or too little heat, or a "chill" may contribute) has marked the beginning of failure. Here is where the great gain in feeding methods has come in, of which we spoke at the outset, and which has brought about what appears now to be a revolution. Instead of the mixed messes of meals, etc., the ready mixed chick foods, consisting of a large variety of seeds and grains, are fed; with the gratifying result of comparatively little infant mortality and a much more rapid growth.

The frontispiece of the August, 1903, *Reliable Poultry Journal* was a group made of photos from life, of White Wyandotte chicks of different ages, and the article describing them gives the following weights of the chicks:

Newly hatched chicks, per pair.....	4	ounces
Four days old chicks, per pair.....	4	ounces
Ten days old chicks, per pair.....	8	ounces
Three weeks old chicks, per pair.....	16	ounces
Four weeks old chicks, per pair.....	1½	pounds
Eight weeks old chicks, per pair.....	4	pounds
Ten weeks old chicks, per pair.....	6	pounds

Experienced broiler raisers expect to bring broiler chicks to two pounds weight (apiece) in ten or eleven weeks, and here we have eight weeks old chicks of full two pounds weight, and ten weeks old chicks weighing three pounds apiece. That difference of two to three weeks clipped off from the old time ten to eleven weeks considered necessary to grow a two-pound broiler makes a tremendous gain in profits. A saving of twenty to twenty-five per cent in time greatly increases the capacity of the brooder houses, as well as saves so much labor and food; and this in addition to the practical elimination of the vexing "bowel trouble" problem and the dreaded infant mortality. Assuming that the business paid a fair profit as formerly conducted, such a saving of time and labor will greatly increase the profits.

This most successful broiler raiser's method of feeding is worth quoting, by way of getting "a point of view." It was given as follows: "The chicks are fed five times a day on hulled oats mostly, with a little cracked wheat and millet seed added. The cracked wheat is changed to whole wheat when they are about a week or ten days old, and cracked corn is fed after they are a week older, which brings them to three weeks of age. After this they were fed three times a day; a mash in the morning, wheat at noon and cracked corn at night, with a feed of cut fresh bone the middle of the afternoon. The mash is made of either corn meal or gluten meal, and wheat bran, with a ration of meat meal, light at first and more of it towards the 'finishing off.' Green food they get each afternoon, in the shape of lawn mower clippings when the grass is growing; later in the shape of rape. In winter finely cut clover is steamed and fed them."

Feeding, he claims, is the crucial point. Said he, "A careless or indifferent feeder will do more harm and waste more food than the profits amount to. The test of good feeding is to keep the chicks just a trifle hungry, and the best judgment of the feeder should be brought to bear. His rule is to give no food to a pen if there is any left uneaten from the last feeding. Many chick raisers mistakenly think that one feeding missed is a step in growth lost. In a limited sense this is true, but a greater loss in growth comes from the chicks overeating and the appetite becoming

cloyed. Not only does a careless feeder waste the food, but he puts the chicks out of condition and checks their growth by cloying them, by taking away their appetite. If food is left before them all the time they will actually eat less, and make a slower growth than if fed judiciously and kept a little bit hungry.

Another writer, describing the methods of a New Jersey broiler raiser, says: "At first the chicks are fed the infertile eggs, cooked, mixed with bread crumbs and rolled oats; then gradually corn meal and bran are added to the ration.

"Fattening these small birds is a difficult problem. The natural tendency is to make growth instead of laying on fat. For the last ten days before killing the ration consists of two parts corn meal, one part bran, about ten per cent cottonseed meal and from twenty-five to thirty per cent beef scraps. This seems like a heavy feeding of meat, and of course would not do for chicks that are to be raised to maturity. The proper weight for killing, twelve ounces, is reached at about six weeks; however, some reach that weight sooner than others."

This writer gives six weeks as the time of raising these twelve-ounce squab broilers by that feeding method. The White Wyandotte chicks told about in the *Reliable Poultry Journal*, and whose weights are given above, grew to the same weight in exactly four weeks; a saving of thirty-three and a third per cent of time, brooder house room and labor. That saving would fully double the profits, and that saving is made by the improved method of feeding, by feeding a ready mixed ration of seeds and grains.

Marketing the Broilers.

Most broiler chickens are marketed "dry picked." This is partly due to the fact that the people educated up to appreciating fine broilers are critical, and the better appearance of the dry picked chicken both enhances its value and increases the consumptive demand. Most of the picking is done by professionals, who are paid so much apiece, and who go from one broiler plant to another as work is offered. The usual price paid for picking broilers is three to four cents apiece, and the picker engaged to pick them not infrequently employs "pinners" to assist him. He does the killing and "rough-picking," and passes the chicks on to the pinners to finish; the pin feathering and cleaning up requiring patience and nimble fingers.

Several excellent articles on "How to Kill and Dry Pick," by competent authorities have appeared in leading poultry journals, in which the process is most carefully described and the illustrations, showing the different movements, greatly aid to a clear understanding of the operation. We recommend a close study of these articles to those interested in dry picking.

Nice Work Important.

It is of great importance that the work be nicely (carefully) done, as a torn and marred chick is less attractive and fetches a lower price. The successful broiler raiser quoted above pays five cents per chick for killing and picking, and when we commented upon the rather higher price than is generally paid he said: "I would rather pay that price and have the chicks carefully picked, the man picking fifty to sixty chickens a day, than to have a man earn the same amount of money by hurriedly picking one hundred a day. It is quite easy for a picker to 'skimp' his work, and

the broilers would be a cheaper looking lot in consequence, shrinking the price perhaps four or five cents a pound." In other words, quality pays in broilers as well as in other things, and the fact that this man's broilers frequently bring him five cents a pound above the highest market quotations, approves the policy of paying the picker a good enough price to insure having the chicks carefully picked.

A good many farmers and small poultry growers ship their chickens alive to a commission dealer, who, in turn, sells them to a picker, who kills, dresses and markets them. Almost always these chicks shipped in alive, are not really good broilers; they are usually "lean" and thin, not plump and round, not well-fattened. A good business is done in buying up these "range" chickens, feeding them a fattening ration for two to three weeks, and then dressing them for market; which is somewhat similar to the fattening done in England and France, the birds there being almost always bought from farmers and small growers, brought to the fattening station and fattened for market. There is a substan-



Well Grown Light Brahma Youngsters.

tial loss to the grower who does not fatten his own chickens; selling them in the "lean" condition means that they are very poor in quality and sell at a low price if marketed at once, if bought by a fatterer and put in good, marketable condition the fatterer gets the bulk of the profits; he gets pay for the increase in quantity of flesh and the premium paid for the better quality.

In an article published in the *Reliable Poultry Journal* a few years ago, a writer said: "In dressing chickens for market, they are killed by cutting the vein and penetrating the brain at a point well back in the roof of the mouth. A deep cut at just the right point will so paralyze the nerves of the bird that the feathers will pick very easily, and much of the trouble in tearing the skin will be avoided. The chickens are dry picked. All the feathers are taken from the carcass with the exception of the tips of the wings, and from these all the quill feathers are picked. If the birds have feathered legs these are also picked. The heads are left on, and the entrails are not drawn. After picking and carefully pin-feathering, they are dropped into huge tanks of water and left a suitable time to cool. In hot weather this water is iced in order to more quickly remove the animal heat. They are then rinsed and the blood cleaned from their heads, and are laid on a bench for the water to drain off. After draining those that are nearest alike are paired together, the legs being tied with twine, and they

are hung in a cool, dark room until the following morning, when they are packed and shipped to market."

There Is Profit in Broilers.

That there is good money made in raising broilers a careful study of the business reveals. There is a great demand for this class of poultry meat, and of the best grade there is never a sufficient supply; furthermore, the demand is constantly increasing and will be still further increased by a better average quality of broilers marketed. Another point in favor of broiler raising is that the work-season of broiler raising for the highest prices comes at a time when other work is slack, hence the time utilized in the broiler raising is not wanted in other departments of the poultry work. Take advantage of the highest prices of March, April and May, and produce the very best quality of broiler chicks, and the resulting profits will be eminently satisfactory.

The Best Varieties for Broilers.

The best broiler chick is one that is grown quickly and fattens readily, is fine-boned and plump, full-breasted, has a rich, yellow skin, and the strong constitution that will stand forced feeding. Undoubtedly the American breeds most nearly fill the bill. The white and buff varieties have the added advantage of freedom from dark pin feathers.

Visits to the great market poultry raisers south of Boston reveal many varieties of stock, used with the Light Brahma most in evidence; this is probably due to the fact that while raising broilers for market they are by no means exclusively broiler raisers, but grow large numbers of soft roasting chickens and capons. Next to the Light Brahmas a cross of Barred Plymouth Rock male on Light Brahma female is popular, and the well-known market poultryman, Mr. J. H. Curtiss, places the White Plymouth Rocks at the very top of the list for all-around utility qualities. The same can be said of the "May R. Poultry Plant," while the Mr. Twining quoted above grew his broilers from Barred Plymouth Rock eggs bought of farmers living in his neighborhood. In all cases excepting possibly the "May R. Poultry Plant" the stock described is "farmers' stock of the

varieties, and would no doubt be found lacking in some points essential in show birds.

Different Kinds of Broilers.

Frequent mention is made of "squab broilers," and yet we do not recall ever seeing them quoted in the market reports. Generally the squab broilers are little six or seven weeks old chicks that weigh, dressed, three-quarters of a pound to one pound each; they are split down the middle and broiled for individual orders in high class hotels, restaurants and clubs. Mr. Duston tells us he "sold hundreds weighing eight ounces each," which is half a pound, and are the smallest broilers of which we have ever heard. There is a quite steady sale for squab broilers throughout the year, but, practically, all the trade is in the hands of dealers who have the finest private family trade and that of the swell hotels and clubs.

The broiler of commerce is a one and a half to two pound chicken, is split in half and served, broiled ("grilled") to two customers; a half to an individual customer. In a few instances we have known of these tender morsels of chicken flesh being stuffed and roasted, then split in halves and served to two individual customers.

A change has been gradually coming about, in the introduction of prepared (mixed) chick foods, and these special foods have given remarkable results in quick growth. Mr. Twining (quoted above) told us he couldn't grow a two pound broiler in eight weeks; that it took him nine weeks (on an average) to grow a one and a half pound broiler and about eleven weeks to bring them to two pounds weight. In the frontispiece of August, 1903, R. P. J. are shown some White Wyandotte chicks that grew to two pounds apiece at eight weeks old, and those chicks were not "forced" at all; they were fed one of the special chick foods and made the splendid growth there chronicled in the natural manner. Obviously there is a decidedly greater profit in two pound chicks at eight weeks old than in two pound chicks at eleven weeks old; we cut off a fourth of the labor and food-charge, and coal for heat, at a stroke. We have seen that there was a goodly profit in the plump and juicy broiler that grew to two pounds weight in eleven to twelve weeks; it is easy to see a still greater profit in the same product grown in eight weeks.

A. F. HUNTER.



A View Showing Some of the Colony Houses Used by the Poultry Department of the Maine Agricultural Experiment Station, Where Much Good Work is Done in the Interest of Profitable Poultry Raising.

SUCCESS AT THE START.

Thirty-Three Hundred Chickens Alive and in Marketable Condition on the Plant of a Beginner—His Methods Discussed—His Plant Illustrated and Described, and It Only Remains to Estimate His Profits.

By P. R. Park.

THE town of Hingham, Mass., enjoys the distinction of being the home of ex-Secretary Long of the U. S. Navy, and one of the largest flocks of thrifty spring chickens in New England. The latter are to be found at the home of Mr. H. G. Jordan, upon whose large farm they are having an unusually favorable opportunity to develop. They are improving all their chances. This seems somewhat at variance with the supposedly established rule that experience is necessary in order to produce large numbers of chicks and have them thrive from the start. Here we have a comparatively inexperienced owner, and the young man in charge of the plant will, we think, take no offense if we say he has had almost no previous experience with incubators and brooders; yet at the time of our visit, the last of May, out of about 3,500 chicks hatched, they had almost 3,300 alive and promising to stay with them until the hatchet intervened. Of this mortality of 200, ninety died that were hatched from a lot of three hundred eggs purchased. Here we have over three thousand chicks raised, we may say, by beginners, and a healthier and more robust lot it has not been our pleasure to see.

We have long been convinced that luck does not enter into the keeping of poultry. There are certain conditions which must be met, and if these are as they should be, there can be but one result, namely, a good lot of chicks hatched from the eggs incubated, and a large number grown of those hatched. We think two of the principal elements which have participated in the success of the Jordan plant this season have been cleanliness, both as regards old stock and young, and a novel method of brooding, which we have not seen before.

In the brooder house for the youngest chicks, as well as the older ones, there is not a vestige of a hover of any kind, simply eight lines of pipe, four running inward and four return, kept at a uniform temperature by an electric regulator. These pipes vary in height from two to three inches in the primary class up to eight to ten inches for the larger chicks. It is rather a novel sight to see one hundred and fifty to one hundred and seventy-five chicks in a brood warming their backs upon these pipes apparently the happiest youngsters in existence without any vestige of the imitations of Dame Nature that have prevailed in other brooding systems.

The natural method, namely, eight to twelve chicks cared for by one mother hen, is so distant and different from the artificial method that imitations seem fruitless.

The writer has long believed that the principal source of mortality among brooder chicks is caused by improper air and incorrect temperature surrounding the chicks the first three weeks of their lives. With the novel method adopted on this plant there can be no doubt that so long as the air in the building is pure that of the hover must be equally so.

When Mr. Jordan first contemplated going into the chicken business, he spent quite a little time visiting the successful plants and also the other kind in his vicinity, and with rare foresight for a novice, traced most of the mortality among the various flocks to the

absence of pure air surrounding the chicks and stock in the several stages of their development. When he constructed his plant, he kept these two facts in mind, and as will be seen in the view of his incubator room, he gives an inlet for air through the top and an outlet of two holes on the level of the floor, one on each side of the building opposite each other. Certainly under these conditions it would be impossible for foul air to stay for any length of time in this room.

Following out this idea, he has his brooder house built with a large number of windows in the south side, insuring plenty of light and air on favorable days, and he uses ventilators in the middle of the house in bad weather. Pipes, as will be seen in the illustration, are eight in number, four outward and four return flows, absolutely devoid of any hover, and the temperature is kept at a uniform heat by an electric regulator, near the heater. This insures a steady tem-

perature with no probability of crowding, for with the correct temperature, the chicks have no occasion to crowd; and if the air in the building is right, that under the pipes cannot fail to be equally pure. These pipes are from eight to ten inches from the dirt floor of the house, the distance being varied by the placing of more or less sand in the runs as the chicks vary in age, thus starting in their first or baby pen with only about three inches between the sand and pipes, and in the end pen, from which they graduate to house number four, the distance is ten inches, thus hardening them off for the cooler temperature of their next home.

In this house the pipes are placed upon the wall and the temperature of the building kept at from sixty to seventy degrees, otherwise under the same conditions.

From this latter house they are moved to colony houses, which we show in the view of the farm. The rule has been this season to place one hundred and fifty chicks in each of



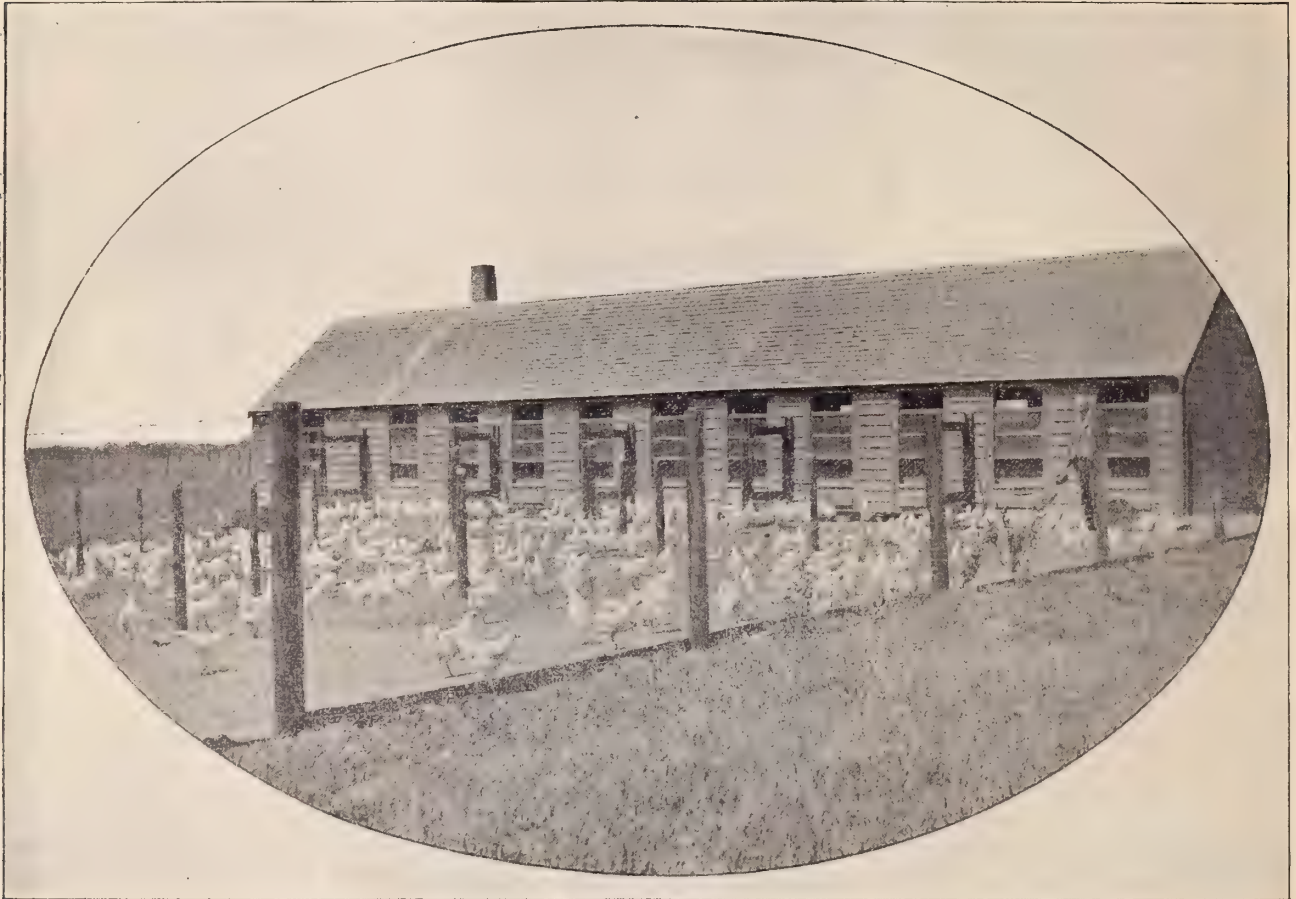
Ventilating Openings in Ceiling and Window in Incubator Room on Jordan Poultry Plant.

these runs, commencing with the younger ones in the first, which is five feet by ten feet, and as they grow older, removing them to the large runs, which are ten by ten feet. These flocks are unbroken until they reach the colony houses, when they aim to keep fifty in a house eight by eight feet. The chickens, however, have hatched so remarkably well this season that in many cases they have been obliged to put over two hundred in a pen, with seemingly no discomfort to the occupants.

The method of feeding may be equally of interest to many, as this also is quite a radical departure from established methods. Here we find chicks started upon nothing but hard grain until they reach the age of four days, when they are given a dish of ground beef scraps, which is kept con-

sorb all the beef scraps and cracked corn that their appetites dictate is best for them, and with a supply of green cut clover, of which the farm furnishes an abundance, they have nothing to ask for in the way of food and care. That they are improving under all these good things a visit to the plant will convince the skeptical.

Mr. Jordan buys nothing but the best of grain and beef scraps, for the keen business foresight with which he manages one of Boston's most successful coal handling establishments, has convinced him that it is not the cost of the food or equipments that ruins the unsuccessful poultryman, the mortality of the youngsters between the age of one and four weeks being the cause assigned for nearly every case where the "plant did not pay."



A Promising Flock in Front of One of the Brooding Houses on the Jordan Plant.

stantly before them through the rest of their happy lives. This way of providing food gives all an equal chance and there is no possibility of there being any of the grain sour, to cause bowel trouble and other ailments. The chicks are given the run of a yard after they reach the age of seven days, which yards are also kept pure by the growing of green stuff between seasons.

After they reach the age of six weeks, cracked corn is added to their diet, and is kept always before them. This system of feeding is, we think, the only one that could be carried out with such large flocks as we find on this plant. Under the old system of mash feeding, the rush and scramble for their share soon make it a case of the survival of the fittest, and the younger and weaker ones do not get their proportion of the rations, so the gap between them and their more successful brothers grows wider with each day. Under this system each one has plenty of time to ab-

The previous experience of the foreman, Mr. Young, with poultry is represented practically by a cipher, he having lived in the state of New Jersey on a large stock farm, with no special liking for the poultry business, simply undertaking it at Mr. Jordan's request, possibly until he could get an experienced man. The success which came to him from the first rapidly interested him in the business, and at the present time he is fascinated with the business as the rankest enthusiast of years' standing.

There is a sanitarium in East Bridgewater for curing consumption in the human family simply by making the patients sleep out of doors, or what amounts to that, winter and summer, and why should not the chicken man adopt for his feathered pets, who are much more creatures of the air than the human family, similar methods?

That Mr. Jordan's plant will be a success this season is an assured fact, for at the present time the Boston market

is paying for soft roasting chicks 37 cents per pound, and he has three separate buyers offering 30 cents a pound alive at his door. All the male birds have been caponized and cannot fail to suit the most fastidious market in the country, namely, Boston.

Jealous neighbors are telling Mr. Jordan and his foreman that they cannot repeat their this season's success another year. Whether they can or not, of course, time only will tell, but Mr. Young is very confident, and we think with good reason, that if given the same conditions, he can repeat the success and better it in some particulars. We would offer him only a few suggestions—that a little more

elbow room be given the growing stock and a number of the three hundred and sixty-five broad acres which Mr. Jordan owns be added to the yards now used in caring for the birds after they leave the brooder house. We suggest also that they be allowed to pick their own clover instead of bringing it to them. Good grazing land is, in our opinion, as important to the successful and cheap growing of poultry as to that of any other class of stock. Good birds have no opportunity to develop on a sand bank, and should not be forced to exist there. Bugs and worms make up a large part of their living and these are not to be found without plenty of good grass for them to grow among.

PROFITABLE ROASTING CHICKENS.

How Large, Soft-Meated Chickens Are Produced for the Season of High Prices—The Advantage of the Balanced Ration—Caponizing the Males to Be Sold as Roasters—A Profitable Adjunct on the Farm.

By A. F. Hunter.

THAT there is a goodly profit in growing soft roasting chickens for market is very evident to the student of poultry conditions, and there are many poultry growers who maintain that the turning of eggs into chickens and growing them to soft-roaster size is not only the most profitable, but is the most satisfactory line of poultry work. When talking one time with Mr. Rankin about the profitableness of poultry work, we stated that we could make three dollars profit in a year from a pullet that came to laying maturity in October, laid one hundred and fifty to one hundred and seventy-five eggs within a year, and then was sold to market. "Yes," said Mr. Rankin, "and I can make forty dollars a year profit from the same bird, by turning her eggs into chickens and growing them to market size." As experienced growers estimate that there is a hundred per cent profit in the business, it would need that eighty chickens be grown to roaster size and average to sell at a dollar each to give the forty dollars profit Mr. Rankin said he could make, and as an experienced poultry grower recently told me he planned to raise about two thousand chickens a year, and that they cleaned up about one thousand dollars a year profit, apparently Mr. Rankin's forty dollars a year profit per hen, if her eggs are turned into chickens and the chickens grown to soft-roasters, is reasonable.

Obviously the price at which the chickens are sold has not a little to do with the amount of profit in the business, and as soft-roasting chickens are highest in price in May and June, with March, April, July and August giving good prices, it is the chickens raised especially for marketing during those months that pay the best profits. In the annual circular of Messrs. Rudd & Son, of Boston, the prices for roasters were given as follows:

Month.	Prices.
January	15 to 20c
February	20 to 22c
March	20 to 25c
April	20 to 25c
May	25 to 30c
June	30 to 40c
July	36 to 25c
August	20 to 23c
September	14 to 20c
October, November and December....	12 to 18c

It takes four or five months to grow a chicken to from four to six pounds weight, and with May and June giving the highest prices, it is evident that the chickens should be hatched in January and February to be grown for marketing in the months of highest prices. As a matter of fact, we find soft-roaster growers hatching their chickens all through the late fall and winter, as the supply of hatchable eggs permits, and they are marketing the chickens all along from March to July, as the demand of the market and the condition of the chickens warrants.

In a great poultry growing section of South Jersey there are chickens hatched late, say in June and July, and grown to an average size of about six pounds, or as large as they can be grown and still retain the "soft" condition of flesh, then dressed for market; if the market conditions do not warrant their being sold at once they are put in cold-storage and held until wanted. An illustration of this I saw at the poultry shipping depot of Mr. Thomas Allen, in February, 1902. Mr. Allen's teams had brought in about two tons of soft-roasting chickens that day, and they were being packed in barrels to go into cold-storage to await the market demand. Mr. Allen told me he had paid one man that day forty dollars for thirty-three birds, an average of about one dollar and twenty cents apiece, and he said those birds were probably hatched in July, which would make them about seven months old when killed for market.

Visiting the great poultry section south of Boston last November I found poultrymen with one to two thousand chickens already out, started on the road to become soft-roasters. The Messrs. Farrar Brothers, of Assinippi, had over two thousand chickens then, and were going on to about forty-five hundred, which is their usual number; the Jordan Farm had then over a thousand growing and were hatching right along. The Messrs. Farrar get their chickens to from four to six pounds weight, and report their highest price last season as thirty-two cents, with an average for the whole season of about twenty-five cents a pound. At that average price their birds sold for one dollar to one dollar and fifty cents apiece, with a mean price of one dollar and twenty-five cents apiece, and something like fifty per cent of that may be fairly estimated as profit; in other words,

they make about one hundred per cent on the cost of hatching and raising a four to six pound soft-roasting chicken.

The Breeds Preferred.

In nearly all cases it is found that the Asiatic, or crosses of Asiatic and American varieties are used to make these extra fine soft-roasters. In the poultry section south of Boston from which so many roasters come to market the Light Brahma is the breed used; in south Jersey it is generally a cross of Light Brahma-Partridge Cochin, or of Light Brahma-Plymouth Rock. It is necessary that the birds be of great size normally, then they will attain the desired large size while still having the essential "soft" flesh of the young chicken. A change in conditions is gradually coming about, however, partly due to the farmers of south Jersey taking thought of the profitableness of the egg side of the business, which is bringing the better laying American varieties into favor. Then, too, the introduction of improved methods of feeding, making it possible to grow a Plymouth Rock chicken (for example) to as great size and more quickly than an Asiatic, is causing a gradual change in front, even in the great stronghold of the Brahmas south of Boston. In a recent number of *Reliable Poultry Journal* is an illustration of a pair of soft-roasters that made the astonishing growth to twenty-three pounds, alive, at six months old, and the larger one weighed eleven pounds dressed. Those chickens were Barred Plymouth Rocks, and that wonderful growth in six months is an 'eye-opener. Those chickens were grown by one of those south-shore poultry growers and dressed for market by the great market poultrymen of that section, Messrs. J. H. Curtiss & Brother. The change of front in that section was indicated by a remark made to me by Mr. Curtiss a few days ago, when he emphatically stated that he considered the White Plymouth Rock to be the best all-around variety of fowls in the world. When we remember that he is a life-long lover of the Light Brahmas, and has always considered them the best market poultry variety, we may well be surprised at such a change. The explanation lies in the simple fact of the quicker growth of the Rocks by the improved method of feeding the prepared (and accurately balanced) ration.

The Males Are Caponized.

All the males are caponized by these south-shore poultry growers, even though almost all of them are sold as soft-roasters; but very, very few of them go to market as capons. They are caponized at about three months old, and the gain is in the fact of their more peaceful disposition. The uncaponized cockerel is of a most pugnacious and quarrelsome disposition, and his quarreling hinders his growth, besides the greater activity promoting the hardening of the flesh. As it is essential that the flesh be "soft," it is easy to understand that caponizing is necessary to the keeping of the right condition. In the south-shore section of which we have been writing there are many thousand chickens raised each year, and Mr. J. H. Curtiss, who is an expert caponizer, caponizes the males for scores of the poultrymen. For this service he charges four dollars per hundred chickens, and is much in demand among his neighbors. The influence of such a man as Mr. Curtiss, in promoting the growing of "better poultry and more of it," is beyond estimating. Within a half dozen miles of his home there are from thirty to fifty thousand chickens grown for market each year, all fine soft-roasters and capons, and the importance of that small section of country as a poultry center is made manifest by its having given a name to a superior quality of chickens grown there; "south-shore" chickens are quoted as the highest standard for quality!

As a Farm-Product.

The poultry growing above described is chiefly in the hands of those who make a specialty of growing fine soft-roasters for market, but that the business is highly profitable to farmers, who make the growing of two or three or four hundred chickens for market annually an adjunct of their regular farm work, there is ample evidence. In the south Jersey section of which I wrote the chickens are almost entirely grown by farmers. In the *Reliable Poultry Journal* not long ago, I described these south Jersey poultry growers as follows: "It may not be quite fair to speak of these poultry growers as 'poultrymen,' because, as a rule, the birds are grown on the farms as a branch of farm work, and are mostly grown by the women of the farms, while the men are engaged in the regular farm occupations; two or three hundred up to five hundred would be the usual yearly product of a farm. It needs but a little arithmetic to demonstrate that a branch of farm work which produces three hundred (or even two hundred) roasting chickens which bring one dollar to one dollar and twenty-five cents apiece when sold is a quite important department of the farm; we doubt whether any other one department produces so much cash income for the amount of labor and capital expended!

"Comparatively few of these poultry growers use incubators; the bulk of the chickens are hen-hatched. Incubators were attempted here and there some years ago, but the generally poor results discouraged their use; latterly, since a better class of incubators is being put out, they are coming to be used more. It is interesting, too, to know that these choicest chickens are not artificially fattened—no cramming machine is used. They are put into large coops, that are four feet wide by six to ten feet long, with a trough along the front to hold the food. The food is a corn meal mash, mixed up with skim-milk when it can be obtained. Sometimes the milk supply is not equal to the demand and then water is used. The fattening takes from four to six weeks.

That the profit is not all for the grower of winter chickens is also evident. I have before me the account of a poultry buyer, which shows the figures of the poultry sales of a small farmer in Worcester county, Mass. These chickens were hatched in the late winter, and sold alive during May and June as soft-roasters of about four pounds weight. The farmer said that branch of his farm work had paid him over fifty dollars a month net profit for the six months' work. The figures of the sales, taken from the buyer's book, are as follows:

No. of Chickens.	Sum Paid.
57	\$ 52.90
52	48.95
104	94.87
106	95.04
106	98.72
75	69.96
63	51.10
68	58.50
45	39.12
51	27.79
727	\$636.95

This is an average of about ninety cents per chicken, and as the grower claimed that they cost to raise not far from forty-five cents apiece and sold for just about double that, he made about one hundred per cent profit on them. He does not keep a hard and fast account with his chickens; he knows they pay him a very substantial profit, and that satisfies him!

The Demand Is Greater Than the Supply.

The market is never over supplied with the best quality of poultry products, and this seems especially true of fine soft-roasters. Marketmen tell us they can never get enough of them to supply the demand, and such commonplace remarks as: "I could sell twice as many, if I could only get them," is the answer to a question as to there being too many of them grown. We all know the reply Webster made to the man who asked if the legal profession wasn't overcrowded,—“There is plenty room at the top.” This applies with especial aptness to the best soft-roasters we have been describing. There may be an over-supply of a cheaper grade, but of the best there is never enough to meet the demand. The increase of wealth and population has result-

It is a truism to say the best pays the best; we all know that. And not only does it pay the best, but there is the most satisfaction in growing the best! Here is a double reward. We not only get the greater profit which comes of producing the best, but we get the satisfaction of being producers of a high-class article of food that is always in demand in the market. It is the plump, full-breasted, fine meated birds that the consumers want and are willing to pay a good price for,—and if we but produce that article our reward is sure.

A considerable study of the soft-roasting chicken reveals several surprises, and one of them is the almost innumerable methods of feeding employed. In fact, it is within the bounds of truth to say, there is no one “method” of



Interior of a Brooding House on the Jordan Poultry Plant, Showing Pipes for Warming the House.

ed in a steadily increasing demand for the best products of the poultryman's art. Wealthy families, leading clubs, hotels and high-class restaurants, all compete for the gilt-edged soft-roasters of the expert poultrymen, and they are willing to pay almost any price, within reason, if the desired quality is presented. In fact, they will pay what they have to pay in order to get what they want. Poultrymen should study the market requirements, and then strive to meet them. The well-known fruit grower, Mr. J. H. Hale, of Connecticut, in an address in which he urged fruit growers to study the market conditions so as to know what the people want, said: "The fine appearance opens the customer's pocketbook, and then quality keeps it open." There is a most important economic principle completely stated in those few words. The fine appearance of an article induces a customer to buy, and good quality in the article keeps him buying.

feeding; each poultryman feeds what he esteems to be a good growing ration, and, indeed, this is the one essential thing. The great point to be aimed at is a steady, continuous growth till market maturity is reached, then market in the best condition. Within the past two or three years prepared chick foods have come into very general use, and have given such excellent results they are likely to be still more generally used. The method is to feed them exclusively for the first five or six weeks, adding a little beef scraps or meat meal, and after about six weeks adding cracked corn to the ration. The essential thing is the increase of the meat food and cracked corn until, the last half of the period, half the ration is of those two foods. With this ration a continuous and rapid growth is secured, and the birds are in fine, fat condition all the time, and are ready to market any time wanted. Of course such a rich ration would not do for laying-breeding stock. Birds grown upon

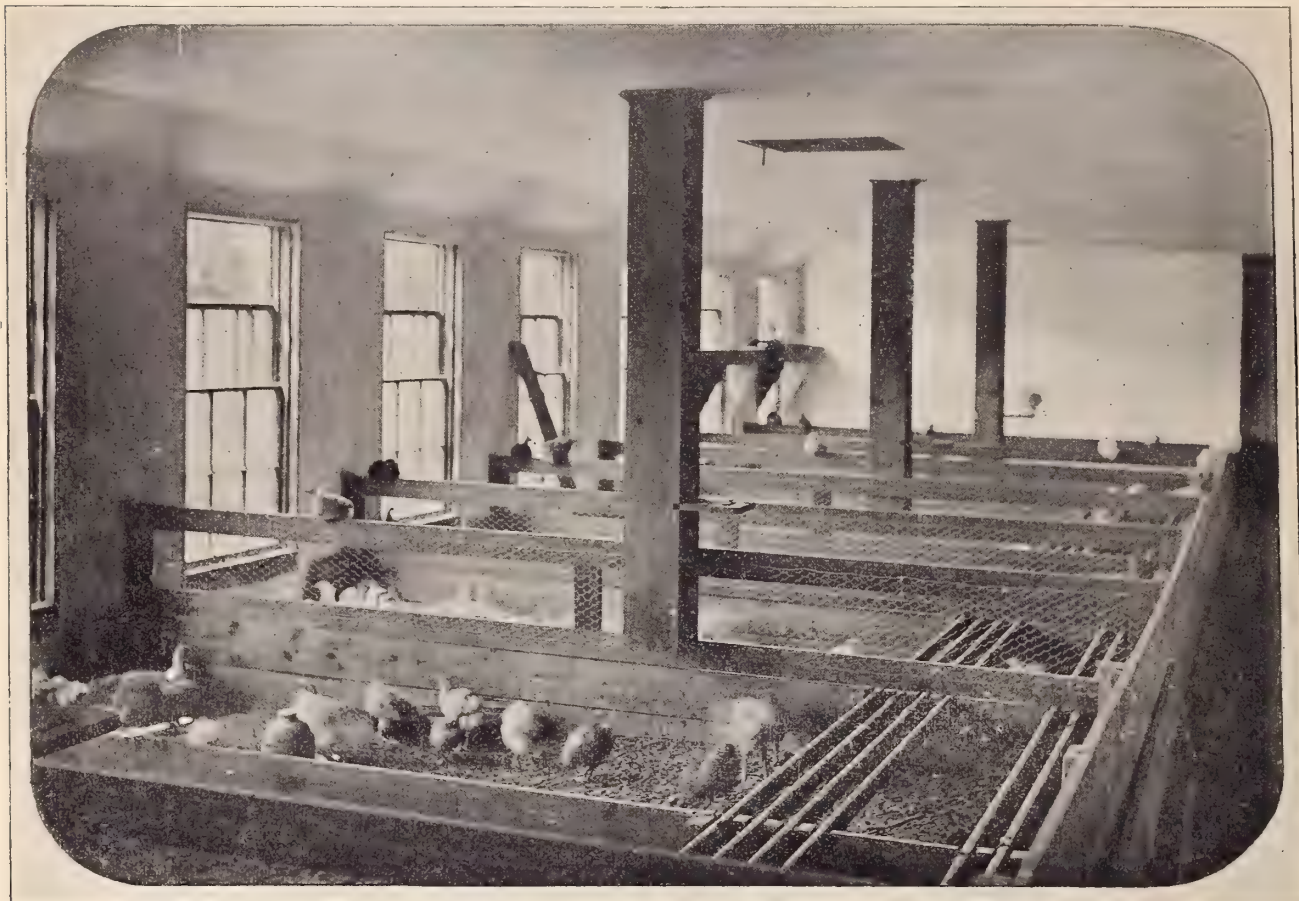
it would be soft, and wholly lacking in stamina, or constitution. Where the birds are to be marketed by the time they are four to seven months old the constitution need not be considered, if the birds have sufficient to stand heavy feeding and continue putting on good, fatted flesh. The important thing is that growth shall be continuous and rapid, and the best quality of flesh attained.

Marketing Soft-Roasters.

The chickens above described are all dry picked, and as a rule are marketed by special dealers. In the south shore section the birds are generally sold alive, to such dealers as Messrs. J. H. Curtiss & Brother, or Mr. Farrar, and picked by their men. In the south Jersey section the birds are

visible under the skin of the breast. That discolored appearance of those two chickens distinctly marred their otherwise fine appearance, and cheapened them. Experienced caterers know that the juices of the meat are less fine and not as pleasing to the palate where that decaying bunch of food is left in the crops and gizzards, and refuse to buy such chickens if better are gettable. The seller has sold a few more ounces of weight in each dozen birds, but had lowered the price several times the gain in weight. Lowering the quality invariably lowers the price of chicken meat, just as of everything else in the world!

There is no one thing that poultry growers so much need to learn as that good appearance and fine quality are most important factors in their profits.



Interior View of a Brooding House, where no Hovers are Used, on the Jordan Poultry Plant.

mostly picked by the farmers, and bought up by such dealers as Allen of Glassboro, who packs and ships them to New York, Boston or Philadelphia, as the markets in those cities warrant.

It is of the greatest importance that the work of picking be nicely done. The tender, "soft" skin may be so torn and marred that a decidedly lower price will be returned for the birds. The importance of a good appearance cannot be too frequently urged. It is safe to say that thousands of dollars are lost to poultry growers each year because of their ignoring this point. Take the one simple matter of the birds being starved (literally not fed or watered) for twenty-four to thirty-six hours so that the crop and gizzard shall be entirely empty at time of killing. Only yesterday we stopped at a marketman's window in Boston to look at a display of fine roasters. Two of them had not been starved before killing and there was a small greenish crop

Many poultry growers cannot understand that it is the "condition" in which stock arrives in the market that determines its value, and seem to think that because it was good stuff when they sent it they should have the highest market price for it. A shipper who sends chickens into the market that show the effects of the soft weather will not receive the price of that which is marketed bright and fresh.

An amusing case of this kind came up in Boston a few years ago. A farmer sent a case containing two dozen ducks on a Saturday morning in summer, and they lay in the express office over Sunday. When they reached the commission dealer on Monday morning they were so "soft" they were practically unfit for human food. Just as the dealer got them open the keeper of an Italian boarding house came in, looking for special bargains, and the dealer called his attention to the ducks. The boarding house man turned them over, felt of them, and then said

he'd give ten cents a pound for them. The offer was accepted joyfully; the case quickly nailed up and delivered to the buyer; and a letter written to the shipper detailing the facts and enclosing a check for the full amount received; the dealer was so glad to get them out of his place before the food inspector got a whiff from them and condemned them to the garbage cart he didn't say anything about commission on the sale. The farmer came right in, raving; said ducks were quoted at twenty-three cents a pound the day he shipped them, that his ducks were as good as Blank's that the dealer had returned twenty-three cents for, and he'd have the full price for those ducks or he'd sue the dealer, denounce him as a cheat, etc., etc. He didn't sue, the dealer never saw or heard from him again, but that poor farmer probably still thinks (if he is living) that the commission

A reader in Sandy Point, Maine, writes: "We have been much interested in your articles in regard to the shipments of eggs and poultry to Boston. We had an experience which leads us to desire a little more information. We have made a specialty of growing large roasters for our local market, and up to last fall were unable to fully supply the demand. The birds most desired are those weighing six to eight pounds apiece, as the people say they have something to cut from (instead of picking bones) with birds of that weight; but last fall the mills were obliged to close, throwing many people out of employment, and the poultry market here collapsed. We accordingly sent a portion of our surplus to our egg commission merchants at Boston. The birds were hatched late in May and the first shipment made October 27th weighed sixty-five pounds to the dozen; the



Bird's-eye View of a Part of the Jordan Poultry Plant.

dealer is a fraud and cheat, and put in his own pocket the difference between ten and twenty-three cents a pound for that lot of ducks!

The old, old saw: "Water always finds its level," applies with great force to poultry sent to market. If it is stuff of the best quality be assured you will get the price of the best; if it is only second, or third, or fourth rate stuff be assured you will not get the price of the best. If you send poultry to market and get only the price of second or third quality stuff, don't sit down and swear that the commission man is a cheat and fraud. Write him and ask why he didn't give you the higher price, and then go to work to improve the quality of your stuff until you can send the best. Grow the best standard-breds, ship them to market in the pink of condition, and you will have no worries about the price!

second, made November 12th, weighed sixty-seven pounds per dozen, and the third, made December 9th, weighed seventy-two pounds per dozen. The first two lots sold at eighteen cents a pound, then practically the top price, but the third brought only sixteen cents a pound. Now in our local market the last would have been regarded as the best, but the Boston commission men wrote us they were "large, but coarse and staggy," and they could not obtain the highest price; that "soft-roasters" were wanted. These birds were all of the same age, but the interval between November 12th and December 9th, while adding to the weight, placed them in a lower class.

What we would like to know is:

First—When the soft-roaster becomes a stag?

Second—Did we not grow our birds fast enough, when at five to five and one-half months old they dressed five and

one-half to six pounds, or don't they want birds of that size?

Third—Should we have shipped them at four to five pounds weight?

We want to meet conditions which will give us top prices; it is easy to get bottom prices any time."

Replying to these questions:

First—Cockerels of different varieties become "staggy" at different ages, and as you fail to mention the variety you raise we are in the dark. As most of the stock raised in Maine is either Barred Plymouth Rocks, R. I. Reds or White Wyandottes, we will assume that yours are of one of the American varieties, and cockerels of those varieties begin to get staggy when about six or seven months old, depending on the treatment. The method of feeding has an influence in hastening or retarding maturity.

Why didn't you ship your birds all in at once, and so be rid of them? The dozen shipped November 12th brought you twelve dollars and six cents, while the dozen sent in December 9th brought you but eleven dollars and fifty-two cents; you had fed them about four weeks longer and then got less money for them. This is one of the commonest mistakes of farmers, they don't market their stuff when it is ready for market, but carry it along at a loss of the food consumed and at the risk of getting a lower price.

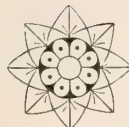
Second—We think you didn't grow the birds fast enough, when they only got to five and one-half to six pounds at five to five and one-half months old, and they would have been of a better quality of flesh,—would have been "softer," if fed a quicker growing ration and brought along earlier. That is another point on which many poul-

try raisers do not discriminate; they raise all the birds alike, feeding them the same foods, whether they are to be killed for market or raised for laying-breeding stock. Then, too, the amount of range allowed them is a factor. Free range encourages the growth of muscle, and muscle is "hard" flesh. If you want to grow fine, "soft" chickens do not let them run all over the farm,—keep them confined to moderate yards, and feed them more heavily of corn meal and beef scraps (or meat meal).

You would probably have done better to have shipped the birds at four to five pounds weight. The great bulk of the trade prefers chickens weighing eight to ten pounds the pair, although there is a good sale for larger birds, and in the spring (say in March), the larger birds sell more readily. If your local trade prefers large birds you should caponize the cockerels, and then they are "soft" ever after, and will grow to eight to ten pounds without becoming "staggy." You are not obliged to sell them as capons because you have caponized them. The popular "south shore" chickens of which you have been reading are caponized, but dressed and sold as soft-roasters.

Caponizing is so easily done, and is so great a benefit in many ways, it is surprising that more poultry growers do not adopt it. A set of special tools can be bought of poultry supply dealers for about three dollars, and with it the nagging, scrappy cockerels are easily turned into docile, tractable birds, that have nothing to do but eat and grow. They remain "soft," and their flesh doesn't harden into muscle, as the cockerels do when they turn "staggy." Caponize all the males not wanted for breeding birds.

A. F. HUNTER.



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